ISO 14001 IMPLEMENTATION IN AUSTRALIA

By

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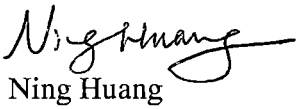
Declaration

I declare that this thesis contains no material which has been accepted for the award of any higher degree in any tertiary institution and that, to the best of my knowledge and belief, the thesis contains no material previously published or written by another person, except when due reference is made in the text.



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Abstract

This study investigates the current situation of ISO 14001 implementation in Australia. It focuses on selected issues such as: (1) the most important reasons for organizations in Australia to adopt ISO 14001; (2) the benefits and costs of certification in Australia; and (3) the problems encountered by early adopters that attained ISO 14001 in Australia. To address these issues, a mail survey was sent to 190 samples, which represented 199 companies that were certified to ISO 14001 before March 2000 in Australia. Seventy-three questionnaires were returned providing approximately 40% response rate overall.

The results show that the most important reasons behind the adoption of ISO 14001 by companies in Australia were improving environmental performance, enhancing due diligence, and improving regulation compliance. Environmental reasons were rated as more important than other reasons such as business competition mentioned in overseas literature.

The results also show that the costs of implementing ISO 14001 are very different from one company to another. It depends on many factors like how many sites and how many programs. Most respondents reported that benefits from ISO 14001 implementation are internal rather than market benefits.

The results highlight that several problems arise when implementing ISO 14001 in Australia. These problems should be addressed by regulators and later adopters in order to gain more benefit for organizations that choose to adopt ISO 14001 in Australia.

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Chapter 1 Introduction

1.1 BACKGROUND

There is no doubt that the environment is of growing importance to all organizations. In the past, organizations, large and small, may have ignored the environmental aspects of their operations in their planning, but this is at a significant and growing level of risk to their long-term existence. Environmental disasters, such as the toxic releases at Bhopal in India, the mercury poisoning at Minimata, the Exxon Valdez oil spill in Alaska and radioactive spillage at Chernobyl, have had a serious impact on the environment. Smaller organizations can also have disastrous impact on the local environment. The cost of clean up and compensation far outweigh the cost of prevention for all organizations (Craddock and Cumming, 1996). Such events are not acts of God beyond the scope of business control. The organizations involved could have avoided many of these disasters if a clearly defined Environmental Management System, like ISO 14000, had been in place.

ISO 14000 is a voluntary management tool developed by the International Organization for Standardization (ISO) after the rapid acceptance of ISO 9000 (Quality Management System standards) and the increase in the number of environmental standards around the world (Jackson, 1997; Quality Network, 1999).

ISO 14000 provides organizations with methodically structured and disciplined control over all aspects of their environmental impacts. The standard allows organizations to avoid risks and costly confusion by incorporating environmental controls into daily operations in a consistent, predictable, and cost-effective manner. ISO 14000 is a

management system standard, not a performance standard. It is intended to be applicable to firms of all shapes and sizes around the world. The standard does not require specific environmental goals. Instead, it provides a general framework for organizing the tasks necessary for effective environmental management. The series of documents that encompass ISO 14000 includes components such as Environmental Management Systems, Environmental Auditing, Environmental Labelling, and product Life Cycle Assessment. The ISO 14001 standard, which lays out requirements for establishing an Environmental Management System (EMS), is the centrepiece of the ISO14000 series. To become registered under ISO 14000, organizations must meet the requirements laid out in ISO 14001. All of the other standards in the ISO 14000 series provide supporting guidance. ISO 14001 is not prescriptive, that is, it does not specify environmental target practices and it does not state how environmental impacts should best be managed. This approach encourages creative and relevant solutions from the organization itself (Darnall et al. 2000; Fredericks and McCallum, 1995; Johnson, 1997; Martin and Sleeman, 1997; Pringle and Leuteritz, 1998).

The ISO 14000 standards are receiving significant amounts of attention from business managers and their legal and economic advisors all over the world, and one commentator has said that the standards may be a *"watershed in the annals of environmental regulation."* (Stenzel, 2000, p.237). Four years after the official release of the first ISO 14000 Environmental Management System standards, over 21,449 organizations (ISO World, November, 2000) worldwide have already achieved certification to ISO 14001. However, the level of implementation of ISO 14001 differs across countries. A significant number of organizations have adopted ISO 14001 in Western Europe and Asia (Delmas, 2000). Japan, Germany, United Kingdom and Sweden are the leading countries with the highest number of certified sites of ISO 14001. Figure 1.1 shows the number of ISO 14001 certified organizations in the top ten countries which actively implement ISO 14001.

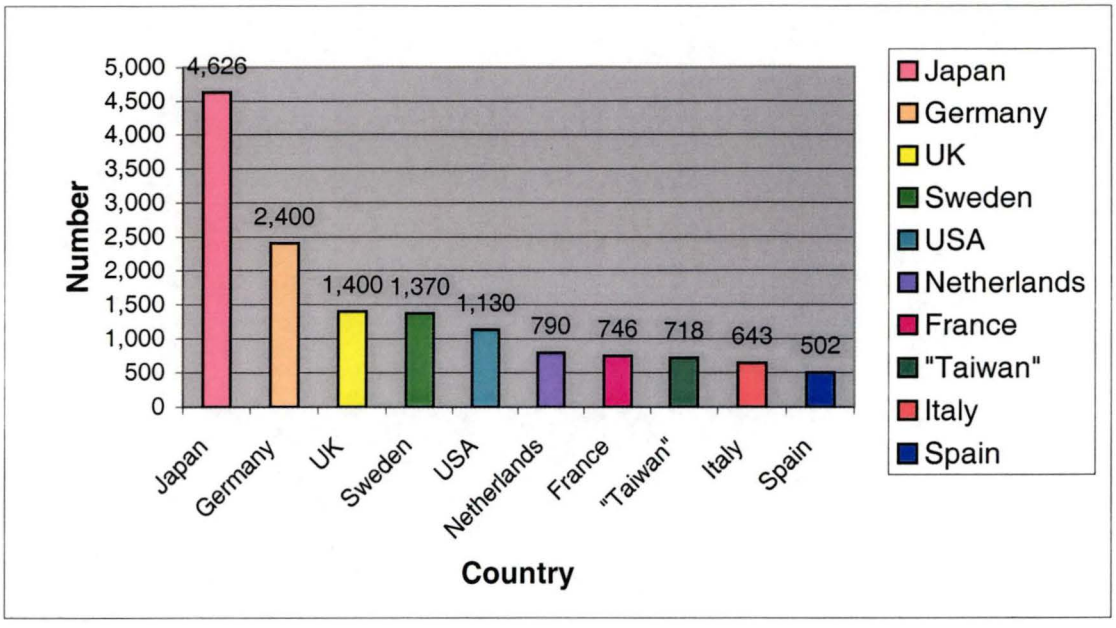

Figure 1.1 The number of ISO 14001 certified organizations in the top ten countries

(Source: ISO World, November 2000)

Australia, like many concerned nations, has been a signatory to a number of International Agreements and protocols, including those relating to ozone depleting substances, greenhouse gas emission (global warming), pollution of the seas, and transportation and disposal of hazardous waste. Most of these agreements have later been reflected in Australian legislation. Concern for environmental issues has also markedly increased at a national level over the past few decades, with land contamination, water and air pollution, disposal of wastes, and deforestation constantly becoming public issues. There is increasing legislation, restriction, penalties and public opinion governing the environmental performance of organizations at the national, state and local levels (Craddock and Cumming, 1996).

The Draft International Standards (ISO 14001, 14004, 14010-12) were approved by members of the Standards Australian Committee as interim Australian Standards and issued in December 1995 as Australian and New Zealand Standards (AS – NZS ISO

14001, 14004, 14010-12). The interim Standards had the status of full Standards when the final Standards were published by International Organization for Standardization (ISO) in 1996 (Quinlan, 1997).

AS/NZS ISO 14001 was adopted unchanged from the International Standard ISO 14001 and is applicable to organizations in Australia. It provides an ideal opportunity for organizations to improve both their environmental and economic performance. For example, Sam Sproule of Alcoa's Kwinana Refinery (the first company to obtain ISO 14000 certification in Australia) said:

> *"Certification has been extremely productive for the plant and has allowed us to take a higher profile in terms of our environmental credentials. It has shown our customers that we continue to give environmental matters highest priority, and has also acted as a valuable communication tool within the company. Certification has assisted greatly in raising the awareness of the importance of environmental controls among all our employees."* (Moy, 1997, p.21)

1.2 RESEARCH PURPOSE AND OBJECTIVES

The main focus of this thesis is on ISO 14001 implementation in Australia. Since Australia only adopted the ISO 14000 Standard in 1996, it means that relatively little is known about this area in Australia. The most comprehensive study to date was a Masters thesis written by Kay Meadows in 1998 (Meadows, 1998). She discussed the drivers and benefits of ISO 14001 implementation in Australia and surveyed the 46 sites across 36 companies that were certified to the ISO 14001 at that time. But now the number of sites with ISO 14001 certification in Australia has increased dramatically to 587 across 199 companies. This rapid growth justifies the need for a new study to update our understanding of the current situation with ISO 14001 implementation in Australia and to identify the problems from the earlier adopters.

The objectives of this thesis are:

1. To review the background of the ISO 14000 standard;

2. To carry out a survey of ISO 14001 certified companies in Australia;

3. To investigate why companies in Australia adopt ISO 14001 certification and assess its benefits and costs;

4. To assess problems encountered by companies that have already attained ISO 14001 certification in Australia.

1.3 OUTLINE OF STUDY

Chapter 2 provides a review of the literature related to ISO 14001 and introduces the general background of ISO 14001 implementation in Australia. Firstly, an outline of the current status of the ISO 14000 standard as seen from an international perspective is presented. Then an explanation of what ISO 14001 represents, why organizations pursue ISO 14001 implementation and its costs and benefits are followed. The literature review also highlights the critical perspectives on ISO 14001 and details the general certification process of ISO 14001. Finally, the current situation of ISO 14001 accreditation and certification in Australia is summarised.

Chapter 3 provides details of the survey methodology. This includes an outline of the design of the survey questionnaire for the mail survey that was used to obtain data, and how the data was interpreted and the limitation of the methodology.

Chapter 4 presents the results of the mail survey.

Chapter 5 examines the research findings and attempts to answer three questions. Firstly, what are the most important reasons for companies in Australia to adopt

ISO 14001? Secondly, what are the costs and benefits of ISO 14001 implementation in Australia? Finally, what are the problems of ISO 14001 implementation in Australia?

Chapter 6 provides a concluding summary, recommendations and identifies those areas in need of further research.

Chapter 2 ISO 14000 Review and Australia

This chapter reviews the literature on ISO 14000 standards, focusing on the ISO 14001 standard, and summarises the current situation of ISO 14001 accreditation and certification in Australia.

2.1 THE ISO 14000 SERIES

2.1.1 Development of ISO 14000 Standards

ISO is a federation of non-government organizations established in 1947 to develop international standards, improve international communication and collaboration, and facilitate the exchange of goods and services. The federation is currently comprised of close to 100 national standards bodies (member bodies) from countries representing approximately 95 percent of the world's industrial production. The headquarters of the ISO secretariat is in Geneva, Switzerland (Conway, 1996). Australia is one of its members.

The ISO 14000 series emerged primarily as a result of the Uruguay round of the General Agreement on Tariffs and Trade (GATT) negotiations and the Rio Summit on the Environment held in 1992. While GATT concentrates on the need to reduce non-tariff barriers to trade, the Rio Summit generated a commitment to the protection of the environment across the world. The environmental field has seen a steady growth of national and regional standards (Quality Network, 1999). Examples of these standards include some dozen eco-labelling schemes worldwide, the British Standards Institute's BS 7750 (Specification for Environmental Management System), the Canadian

Standards Association's Z750 (A Guide for a Voluntary Environmental Management), and the EUEMAS (Eco-Management and Audit Scheme). Other similar environmental management standards have been developed by the French Standards Association, the South African Bureau of Standards and Spanish Standards Association. With the proliferation of these standards, it was suggested that an international environmental standard be developed by the ISO to reduce the fragmentation of international markets, for the benefit of companies of all the countries in the world. As a result, the ISO began to respond by developing the ISO 14000 standards after the rapid acceptance of ISO 9000.

- In 1991, ISO established a Strategic Advisory Group on the Environment (SAGE) to assess the need for international environmental management standards with 20 countries, 11 international organizations and more than 100 environmental experts participating in the preparation of the basic document.

- In 1992, a technical committee (TC207) under SAGE was established to develop environmental standards. Environmental standards include five areas of environmental management: environmental management systems; environmental auditing and related environmental investigation; environmental labelling; environmental performance evaluation; and life-cycle assessment.

- On June 1, 1993, ISO's Technical Committee TC 207 held its first plenary meeting. TC207 was divided into five subcommittees (SCs) for each category of standard and one SC to cover the terms and definitions of the standards. In addition, a working group, which reported directly to TC 207, was formed to deal with the environmental aspects in product standards. The five SCs have two or more working groups (Conway, 1996; Murtaza, 1996; ISO 14000 InfoCenter, 2000).

2.1.2 Brief Description of the standards

In brief, there are five environmental management standards, a guide, and a set of terms and definitions (Cascio et al., 1996).

Figure 2.1 illustrates the ISO family of standards and the interconnection between them. As shown below, there are two discrete types of standards; one dealing with evaluation of organizations (e.g. ISO 14001, Environmental auditing - EA, and environmental performance evaluation – EPE), and another dealing with evaluation of the product (e.g. product standards, Life Cycle Assessment (LCA) and Environmental Aspects in Product Standards (EPAS) - formerly a standard but, once drafted, was redefined as a guide) (Woodside et al., 1998).

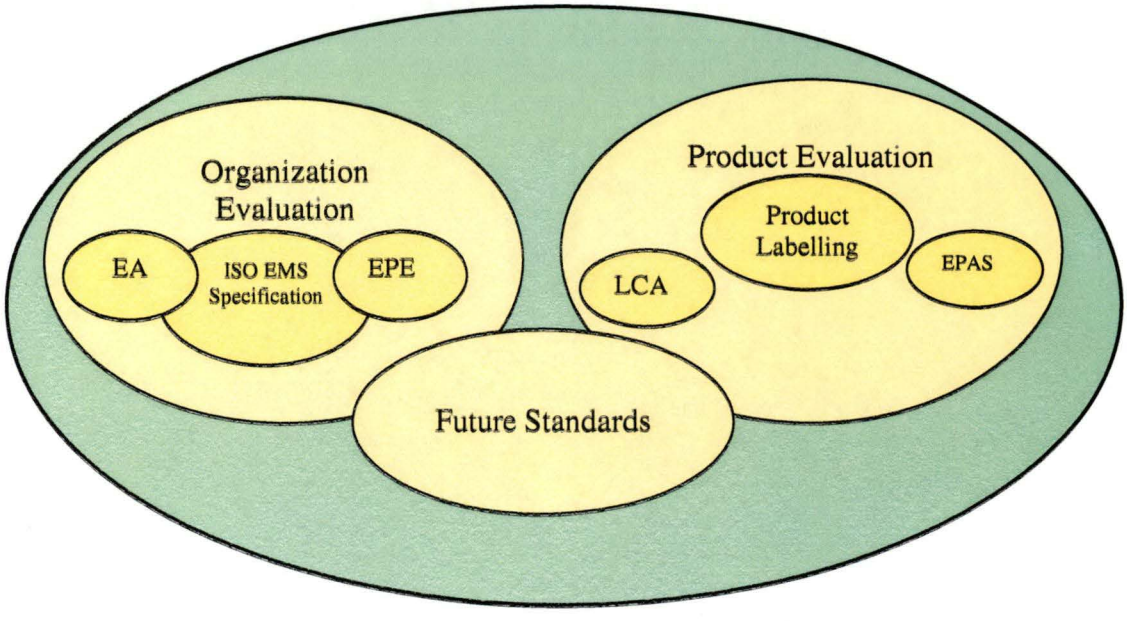

Figure 2.1 ISO 14000 family of standards
(Source: Woodside et al., 1998)

Table 2.1 details the names and purpose of the key document in the ISO 14000 family. ISO is always considering the development of new environmental management standards that support the existing standards or that define new areas.

Table 2.1 Names and purpose of the key document in the ISO 14000 family
(Source: Woodside et al., 1998)

Environmental Management System (EMS) Standards
ISO 14001-*Environmental Management Systems Specification* This standard lays out elements of an EMS; it applies to organizations of all sizes, and those who seek registration to the standard must conform to all requirements delineated within. ISO 14004-*Guidance Document for EMS* This document provides guidance on setting up an EMS; it is most useful for those organizations with immature systems.
Environmental Auditing (EA) Standards
ISO 14010-*General Principles of Environmental Auditing* This document provides general principles of environmental auditing; it is meant to apply to all types of environmental auditing and covers topics as objectivity, independence, competence, due professional care, and audit criteria. ISO 14011-*Auditing Procedures-Auditing of Environmental Management Systems* This document provides guidance for the EMS audit; although its use is not required, it provides pertinent information on how to develop an audit plan and conduct of an EMS audit. ISO 14012-*Auditor Qualification Criteria* This document sets forth guidance for qualification criteria for internal and external environmental auditors who perform EMS audits.
Environmental Labels and Declarations Standards
ISO 14020-*Principles of All Environmental Labelling* This document provides guidance on the goals and principle that should be consistently incorporated into all types of environmental labelling programs. ISO 14021-*Self-Declaration of Environmental Claims-Terms and Definitions* This document is meant to apply to manufacturers who are declaring that their product has an environmental attribute (i.e., it is recyclable, energy-efficient, etc.) ISO 14022-*Symbols* This document addresses environmental labelling symbols. ISO 14023-*Testing and Verification* This document addresses testing and verification of environmental claims. ISO 14024- *Practitioner Programs: Guiding Principles and Procedure for Multiple Criteria (Type 1)* This document lays out the principles and protocols for environmental labelling programs.
Environmental Performance Evaluation (EPE)
ISO 14031-Environmental Performance Evaluation This document addresses performance indicators for operations in terms of emissions and efficiencies of processes; it also addresses performance indicators for the environment itself.
Life-Cycle Assessment (LCA) Standards
ISO 14040-*Principles and Framework* This document provides a clear overview of the practice, applications, and limitations of LCA to a broad range of potential LCA users. ISO 14041- *Goal/ Scope Definitions and Inventory Analysis* This document decries special requirements and guidelines for the preparation, conduct, and critical review of the life-cycle inventory analysis. ISO 14042-*Impact Assessment* This document provides guidance on the impact phase of life-cycle assessment. ISO 14043-Interpretations This document provides guidance on how to interpret the life-cycle assessment of impacts.

2.2 THE ISO 14001 EMS STANDARD

2.2.1 Specifications of the Standard

ISO 14001 is the most widely recognized environmental management standard. It was finalized and issued as a first edition on September 1, 1996. It is a specification standard, which means that organizations that conform to its requirements can become registered to the standard. ISO 14001 was written as a consensus standard with nearly 50 countries participating. The 14001 standard is applicable to all types and sizes of organizations with diverse geographical, cultural, and social conditions. It also applies to all parts or any single part of an organization and/or its activities, products, and services (Conway, 1996).

A basic model of the standard is depicted in Fig. 2.2 (Woodside et al., 1998).

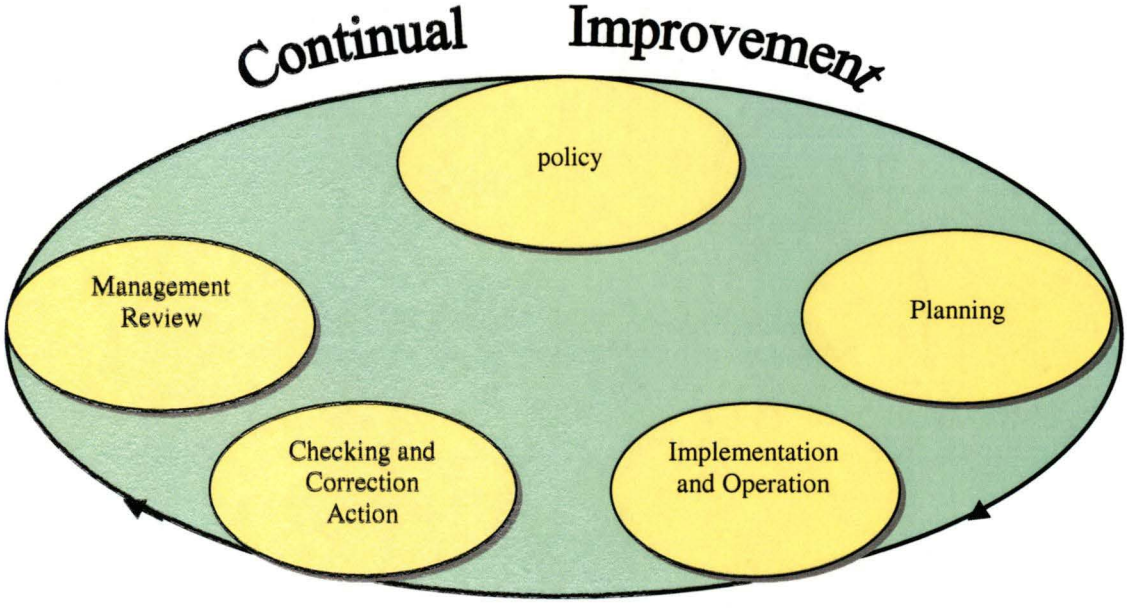

Figure 2.2 Environmental Management System model

(Source: Woodside et al., 1998)

The ISO 14001 standard is organized as follows (Woodside et al., 1998. p. 7):

> *Introduction. This nonmandatory section sets the tone and context for implementation of the standard. In addition to background information about applicability and use of the standard, it provides a very basic model of the framework that the standard sets, which includes the five major elements and the concept of continual improvement. This model is presented in Fig. 2.2.*
>
> *Scope (Section 1). This section specifies applicability and introduces Annex A as nonmandatory guidance.*
>
> *Normative references (Section 2). None are listed at present.*
>
> *Definitions (Section 3). Thirteen definitions that apply to the standard are presented. Examples include definitions of environmental aspect, continual improvement, environmental performance, and interested party.*
>
> *Environmental Management System (EMS) requirements (Section 4). This section details the requirement section so that misinterpretation of the standard can be avoided.*
>
> *Annex A. This nonmandatory (informative) annex provides guidance on the EMS requirement section so that misinterpretation of the standard can be avoided.*
>
> *Annex B. This second nonmandatory (informative) annex provides two tables that identify the links and broad technical correspondences between ISO 14001 and ISO 9001.*

Annex C. This final nonmandatory (informative) annex provides a bibliography of ISO 9000 standards, environmental audit guidelines, and EMS guidance document.

Five major elements included in the ISO 14001 standard are environmental policy, planning, implementation and operation, checking and corrective action, and management review (see Figure 2.3).

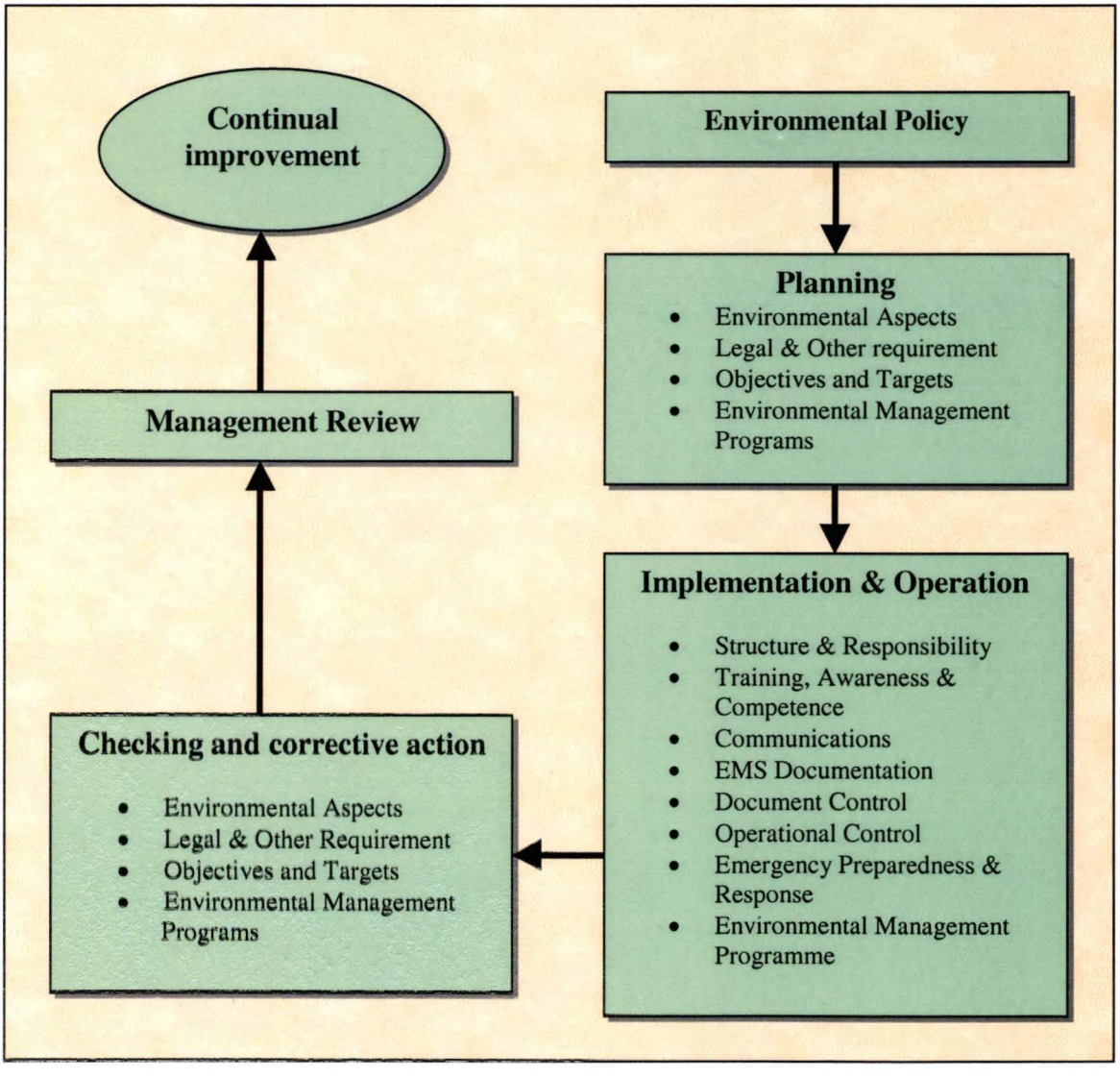

Figure 2.3 Five major elements of the standard

(Source: Craddock and Cumming, 1996)

Numerous authors (Woodside et al., 1996, Standard Australia/Standards New Zealand, 1996, Cascio et al., 1996; Gayle, 1998; Jackson, 1997) outline each of these elements, as summarised in the following paragraphs.

A. Environmental policy

In section 4.1 (b) of ISO 14001, the standard requires that an organization's top management issue an environmental policy statement setting forth the organization's commitment to continual improvement of its environmental policy. Additionally, the policy must contain a commitment to the prevention of pollution and to statutory and regulatory compliance. The standard also requires the organization to communicate the terms of the policy to its employees. Finally, an organization must make the policy accessible to the public.

ISO 14001 defines "continual improvement" as:

> *The process of enhancing the environmental management system in order to achieve improvements in environmental performance in line with the organization's environmental policy.* (Standard Australia/Standards New Zealand, 1996a, p. 1)

"Prevention of pollution" is defined as:

> *Use of processes, practices, materials or products that avoid, reduce or control pollution, which may include recycling, treatment, process changes, control mechanisms, efficient use of resources and material substitution.* (Standards Australia/ Standards New Zealand, 1996a, p. 2)

B. Planning

The planning approach in ISO 14001 illustrates the method by which an organization must implement its environmental policy.

1. Identify environmental aspects of the organization's activities, products and services that it can control and influence; determine which aspects are associated with significant environmental impacts;

2. Identify and maintain access to legal and all other requirements that apply to the environmental aspects of the activities, products and services;

3. Establish objectives and targets; and

4. Establish the EMS.

C. Implementation

Implementation of an EMS occurs when management provides financial, technological and human resources for its organization and nominates a representative to oversee the application and maintenance of the EMS. Since success of the EMS requires commitment by the entire organization, an organization must develop a process to train employees so that they understand their role in the execution of the environmental policy. A successful EMS also depends upon open communication within the organization. The standards require a procedure for constant dialogue among management, employees and "interested parties" regarding the EMS. For example, an organization must plan to address the concerns of employees or the public regarding the environmental impact of an organization's activities. "interested party" is defined as:

> *Individual or group concerned with or affected by the environmental performance of an organization.* (Standards Australia/Standards New Zealand, 1996a, p. 2)

When implementing an EMS, an organization must maintain documentation describing the "core element" of the EMS and the manner in which they interact. An organization must design a procedure that ensures that EMS documents are comprehensive enough to allow the EMS to function effectively, and enable a reviewing auditor to evaluate the management system. Section 4.3.6 requires an organization to develop operational control procedures to ensure that the activities and targets are properly achieved. Also, ISO 14001 requires an organization to develop emergency procedures for potential accidents, such as accidental releases into the air, land or water. These emergency procedures include preventing or mitigating environmental impacts. An organization must review, revise and test these procedures to ensure its emergency preparedness.

D. Checking and corrective action

An organization must establish procedures to monitor and measure operations and activities that could affect the environment. It must plan regular reviews and record the results to gauge implementation and compliance. It must store and maintain all records.

> *"Records are evidence of the ongoing operation of the EMS.... The effective management of these records is essential to the successful implementation of the EMS."* (Standards Australia/Standards New Zealand, 1996b, p. 22).

An organization must have procedures in place that designate the parties responsible for investigating incidents of non-conformance, for mitigating environmental impacts, for performing corrective action, and for preventing further non-conformance.

As part of an organizational "check-up," the standards require an established program for periodic EMS audits to assess whether the EMS is properly implemented and whether it conforms to the plans to fulfil the policy. The audit may be performed by an unbiased internal or external auditor. The audit provides an evaluation of the management system. It need not assess whether an organization is in technical compliance with environmental regulations.

E. Management Review

To continually improve the EMS, the final provision of ISO 14001 requires upper management to evaluate the EMS for both effectiveness and possible alterations to the EMS. Management must document the findings of its reviews, which are based upon audit results. Management must also document the degree of accomplishment of objectives and targets, evaluate the continuing suitability of the EMS and address the concerns of a relevant "interested party".

These elements interact with each other to form a road to reach the purpose of continual improvement. This road map will help business to arrive at a company's self-defined image of environmental responsibility (Johnson, 1997).

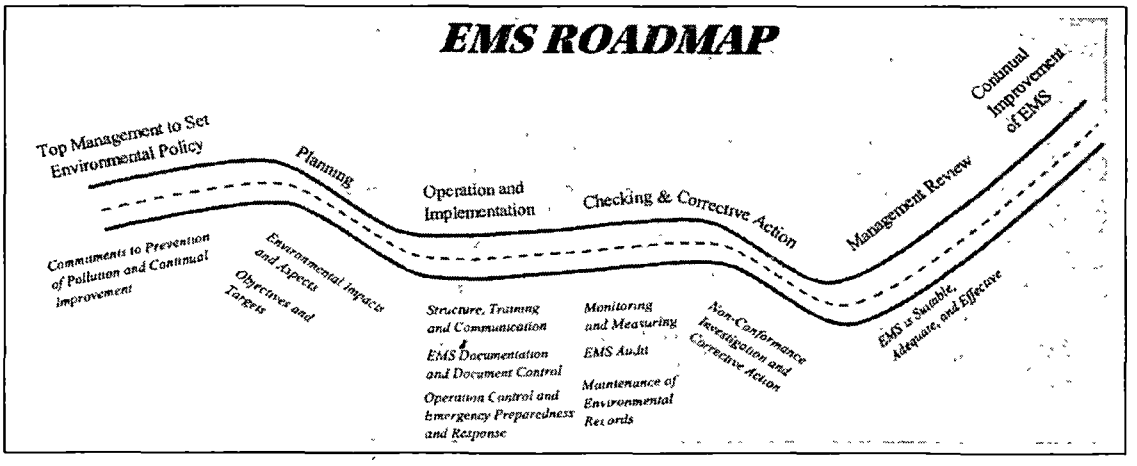

Figure 2.4 The roadmap of EMS

(Source: Cascio et al., 1996)

Pringle and Leuteritz (1998) summarize the critical characteristics of an ISO 14001 EMS (see Table 2.2).

Table 2.2 Critical characteristics of an ISO 14001 EMS

(Source: Pringle and Leuteritz, 1998)

It is centred on and driven by environmental impacts. The standard outlines a core set of planning activities that ensures an organization will: • Identify organization operations, processes, and products that have environmental impacts • Evaluate which impacts are significant; • Set objectives and targets for reducing negative impacts; and • Select and implement activities to achieve identified targets.
It promotes integration of environmental management and business function. The standard promotes integration of environmental management with operations and overall organizational management, by requiring: • An environmental policy defined by top management • Consideration of operating conditions and controls and their effect upon environmental impacts • Specific identification of needed authorities and responsibilities for implementation • Periodic management review of system results and environmental performance
It provides for continual improvement. The EMS is designed to continually improve system and environmental performance, through: • Creation of specific timelines, authorities, and designated responsibilities for plan execution and activity implementation • Periodic compliance audits to identify compliance procedure improvements • Periodic EMS audits to assess progress towards stated goals and identify needed system improvements Monitoring and measurement of activities related to environmental impacts
It is verifiable. Organization activities and conformance with the standard can be objectively verified, because: • Documentation requirements ensure that both conformance with the standard and EMS performance can be audited; and the ISO certification process sets specific standards and practices for auditing both conformance with the standard and performance of the EMS.

2.2.2 Certification of ISO 14001 standard

Organizations can either be "certified" under ISO 14001 by third party certification or "self-declare" their participation. Third-party certification ensures that the organization's Environmental Management System progresses in accordance with the requirements of ISO 14001 standard. (Hammerschmid and Uliana, 1998).

In the case of third-party certification, it is likely that organizations will seek to become certified to ISO 14001 by application to a "registrar". Once an application is filed, the independent auditor from a registrar will perform conformity assessment evaluating an applicant's EMS system against the ISO 14001 criteria. Once granted, it will last for three years (Conway, 1996).

The Flowchart of the certification process of NCS International Pty Ltd shows a typical certification process for ISO 14000 (see Fig 2.5).

Wide spread acceptance of the ISO 14001 standard has accelerated international demand for qualified Environmental Management System auditors.

As defined by ISO 14012, an environmental auditor is a "person qualified to perform environmental audits." EMS auditor is based on a three-level system. Level 1- Provisional Auditor (EMS-PA): an early entry grade for those with little or no EMS experience. Level 2- EMS Auditor (EMS-A): qualifies individuals to conduct EMS audits as part of an audit team. Level 3 - EMS Lead Auditor (EMS-LA): qualifies individuals to manage and coordinate EMS audits as the audit team leader (Standard Australia/Standard New Zealand, 1996c and Wilson, 1998).

According to the qualification criteria listed in this standard, an auditor must meet certain levels of education or work experience and have received formal and on-the-job training to develop competence in carrying out environmental audits. The standard

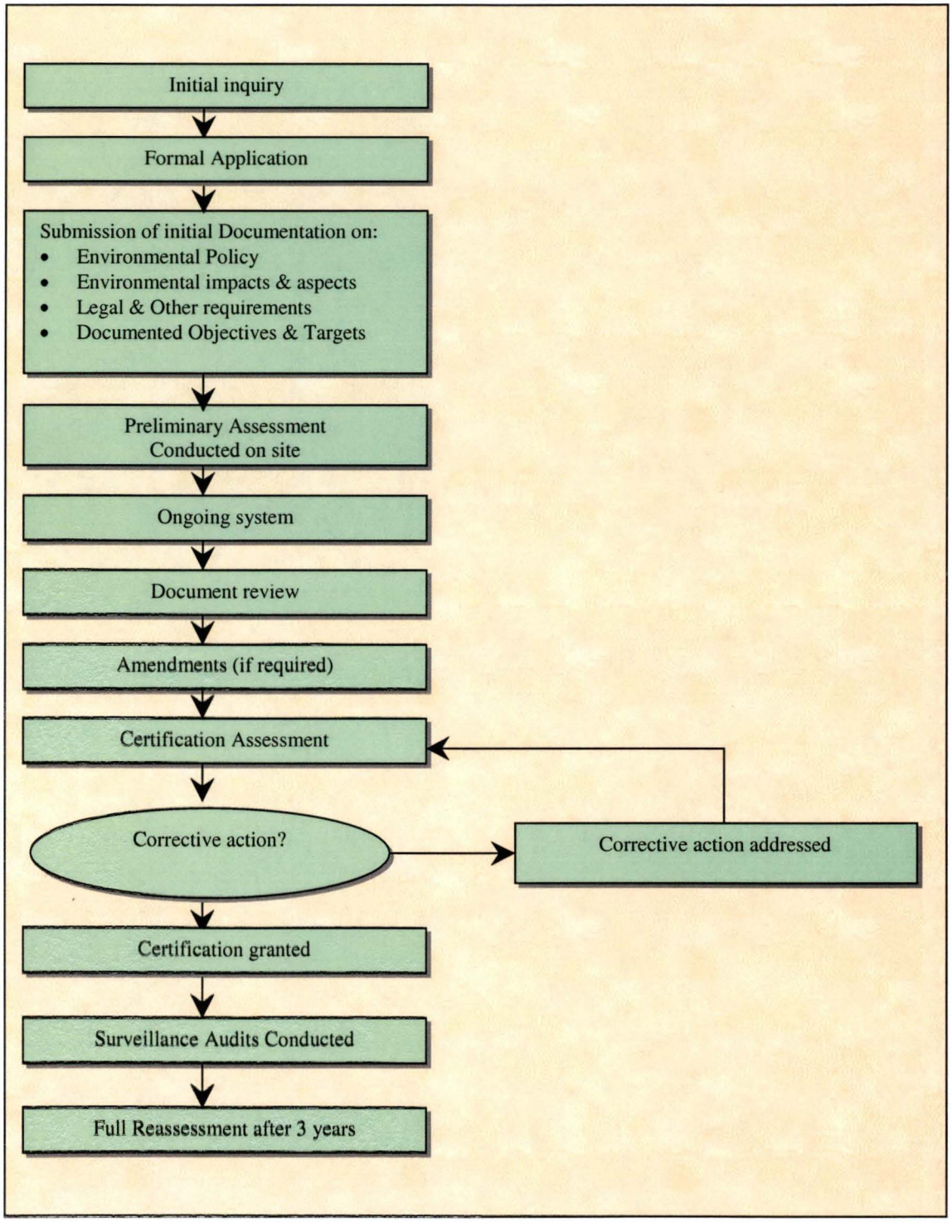

Figure 2.5 The flowchart of ISO 14001 certification process

(source: Hammerschmid and Uliana, 1998)

states that formal training should address environmental science and technology; technical and environmental aspects of facility operation; relevant requirements of environmental laws, regulations, and related documents; Environmental Management Systems and standards against which audits may be performed; and audit procedures, processes, and techniques within three consecutive years. An auditor should receive "on-the-job" training for 20 equivalent workdays of environmental auditing and for a minimum of four audits, including involvement in the entire process under a lead auditor. Lead auditors must meet more extensive requirements (Hemenway, 1995).

2.2.3 Drivers and benefits for ISO 14000 implementation

Many surveys and studies have investigated the drivers and benefits of ISO 14001 certification.

A. Drivers

In general, according to Meadows (1998, pp.14-15), at the level of organization, the main driver of ISO 14001 can be related to:

- *Operational factors, such as standardizing and/or improving the way in which environmental issues are managed across the organization, linking environmental and quality management, and ensuring that the business is organized effectively and appropriately;*

- *Environmental regulatory factors, such as improving compliance activities and/or seeking to change the way regulatory authorities assess compliance across the organization;*

- *Financial factors such as controlling and/or reducing costs of waste, energy, production and insurance;*

- *Competitive factors from being at the leading edge of innovation, competitive effectiveness and marketing, or improving access to national and/or international markets in case ISO 14001 certification becomes a non-tariff trade barrier;*

- *Environmental factors including meeting the expectations of the community and existing and/or potential customers by promoting an environmentally responsible image.*

Other authors such as Boiral and Sala (1998), Cascio and Shideler (1998), SGS Yarsley (1996), Graff (1997), Kuryllowicz (1996), ISO 14000 West Coast Working Group-WCWG (2000), Mohammed (2000), Martin and Sleeman (1997) and Diamond (1996) also refer to some, or most, of the above drivers. Table 2.3 provides a summary of each of the drivers mentioned in each of these publications.

B. Benefits

There are considerable benefits associated with implementing an Environmental Management System based on the ISO 14001 Standard and achieving certification by an independent third party. Lally (1998, pp.10-15) detailed benefits of ISO 14001 certification as follows:

- *It has improved the organization's environmental performances;*

- *It has changed management's environmental awareness in the organization;*

- *It has enhanced employee's environmental capacity building;*
- *It has improved the internal environmental management methods;*
- *It has improved the management system for environmental accident and risks;*
- *Its adoption is cost-effective and productivity is improved;*
- *It has promoted compliance with existing national and state laws;*
- *It has improved public relations, work relations within the organization, and relations with government bodies responsible for environmental matters;*
- *It has attracted "Green" consumers and gained competitive advantage in the market;*
- *It has encouraged other environmental initiatives, such as environmental labelling of products or community environmental projects.*

Other authors such as Altham and Guerin (1999), Cascio (1994), Australian Local Government Association (1996), International Institute for Sustainable Development-IISD (1996), American National Standards Institute-ANSI (2000), Standards Council of Canada-SCC (1999), Kirkpatrick (1995), Pouliot (1996) and Woodside et al. (1998)

refer to some or most, of the above benefits. Table 2.4 provides a summary of benefits mentioned by each of these authors.

Table 2.3 Drivers of ISO 14001 certification

Drivers \ Author's opinion		1	2	3	4	5	6	7	8	9	10
Organizational	To formalize support for environmental programs within the organization	√	√	√			√	√	√		
	To standardize environmental activities within the organization	√	√			√	√		√	√	
	To enhance due diligence	√				√	√		√		
Financial	To control costs	√					√				
	To reduce insurance premium	√					√				
	To get better access to finance	√		√			√		√		
Environmental	To improve environmental performance	√		√			√			√	√
	To conserve materials and energy	√	√			√	√			√	
Regulatory	To improve regulation's compliance	√						√		√	√
	To influence government regulatory change									√	√
	To improve knowledge of regulations	√			√						
Marketing	To improve competitive advantage	√		√	√	√	√	√	√	√	√
	To improve access to markets	√		√	√	√	√		√	√	√
	To improve marketing opportunities	√		√	√	√	√		√	√	√
Public Relations	To meet customers expectations	√	√	√		√	√	√			
	To improve public relations	√					√	√	√		
	To meet community exceptions	√					√				

Note: 1-Meadows (1998), 2- Boiral and Sala (1998), 3-Cascio and Shideler (1998), 4-SGS Yarsley, 5-Graff (1997), 6-Kuryllowicz (1996), 7-WCWG (2000), 8-Mohanmed (2000), 9-Martin and Sleeman (1997), 10-Diamand (1996).

Table 2.4 Benefits of ISO 14001 certification

Author's opinion / Benefits	1	2	3	4	5	6	7	8	9	10
It has improved the organization's environment performance	√			√	√	√				√
It has changed management's environmental awareness in the organization	√			√			√			
It has changed management's environmental capacity building	√	√		√		√				√
It has improved the internal environmental management method	√				√	√			√	√
It has improved the management system for environmental accidents and risks	√	√				√	√			√
Its adoption is cost-effective and productivity is improved	√	√				√		√	√	
It has promoted compliance with existing national and state laws	√		√	√	√	√		√	√	
It has improved public relation, work relations within the organization, and relations with government bodies responsible for environmental matters	√	√	√		√	√	√		√	√
It has attracted "Green" consumers and gained competitive advantage in market	√	√			√	√	√	√		√
It has encouraged other environmental initiatives, such as environmental labelling of products or community environmental projects	√									

Note: 1-Lally (1998), 2- Altham and Guerin (1999), 3-Cascio (1994), 4-Australian Local Government Association (1996), 5-IISD (1996), 6-ASNI (2000), 7-SCC (1999), 8-Kirkpatrick (1995), 9-Pouliot (1996), 10 – Woodside et al. (1998)

2.2.4 Costs of ISO 14001 implementation

Implementation of ISO 14001 costs time and money and the extent of those costs will depend on the scope of the EMS. For example, an EMS can be international, national, or limited to an individual plant. Implementation and certification costs are estimated to range from $100,000 to $1 million for plants run by a multinational corporation (Stenzel, 2000). Costs for small or medium–sized plants may range between $10,000 and $100,000 depending on the company's individual needs and circumstances (Stenzel, 2000). The cost of implementing an Environmental Management System is often proportional to the size and complexity of the operation. Costs between $15,000 and $150,000 per site have been reported (Graff, 1997). However, many support services have developed since the introduction of ISO 14000. For example, computer support services, which are used to guide ISO 9000 companies into certification, are now being used by ISO 14000 companies as well. These computer support services provide companies with a cost-effective way to gain training and practical results (Lally, 1998).

Internal costs of ISO 14001 include personnel time for training and implementation of EMS, and costs of technology required to deal with the environmental information being compiled and communicated. There are also costs of new monitoring equipment or upgrades to current equipment. These internal costs are estimated to account for approximately eighty percent of the costs of implementation of Environmental Management System (Stenzel, 2000). There are also external costs. A business needs the services of a register for the initial and continuing audits. In addition, legal counsel must be hired to examine the company's compliance with applicable environmental laws (Stenzel, 2000).

Companies are finding that the major Environmental Management System development cost is the cost related to employee time (Graff, 1997). ISO requires that all employees are informed about the company's environmental policy. In particular, specialized knowledge is required among those whose job may have a significant environmental

impact. Training programs can be resource intensive especially considering the time lost from production and additional costs for instruction and the amount of time taken to document procedures for certain critical operations. Companies with high employee turnover or multiple sites may find knowledge transfer technologies and self-directed learning tools effective to develop and maintain employee capabilities and minimize some of these costs. Capital costs for Environmental Management System development are relatively low in comparison, assuming companies already have appropriate control equipment and monitoring instrumentation that comply with federal, state, and local requirements (Graff, 1997).

2.2.5 Weaknesses and criticisms of ISO 14001 Standard

Although the goals of ISO 14001 are reasonably stringent, there have been serious criticisms levelled against the standard by environmentalists. It has been suggested that that the ISO 14001 standard do not set any level of environmental performance and as such companies can set the lowest level of compliance, i.e. the local regulatory threshold. There is no incentive to set ambitious goals. On the other hand, some companies fear that the goal of continued environmental improvement will lead to increased regulation by the Environmental Protection Agency (EPA) and state agencies instead of less. Another criticism of the ISO 14001 standard is that companies can choose to self-certify rather than seek third-party certification. Without independent means of verifying information, the entire certification process is thrown into question (Murray, 1999). Those opposed to ISO 14001 believe that it will only result in unnecessary paperwork and few benefits (Kissel and Waston, 1995).

Benchmark Environmental Consulting (1995) argues that ISO 14001 certification will not allow a company to demonstrate that it has good environmental, health and safety performance since ISO 14001 requires only conformance and a measure of input rather than output. This results in a weak standard that will only ensure process efficiency. Benchmark Environmental Consulting (1995) notes that while business efficiency is not a public concern, the environmental performance of business is important.

A third criticism of ISO 14001 is the fact that no environmental information collected by a certified company needs to be disclosed to the public – it is considered confidential. ISO 14001 represents a regressive standard in some ways: multinationals will not be required to abide by the applicable national or regional laws and regulations of its location. In other words, the progress of initiatives such as the Canadian Responsible Care Program, the Japanese Keidanren Business Charter on Sustainable Development that requires multinationals to apply the same standards as the host country world-wide, is lost in ISO 14000. ISO 14001 requires that multinationals set "double standards". The environmental impact of multinationals may worsen rather than improve, since multinationals certified under ISO 14001 can choose to locate in countries which have few or lenient environmental laws and regulations, yet still comply with ISO 14001 (Benchmark Environmental Consulting, 1995).

The drawbacks of ISO 14000 certification include the present uncertainty of the future importance of the standard: an over-estimation could be extremely costly for a company (McCreary, 1996).

Doubts and criticism about ISO 14001's effectiveness in improving environmental performance have led some managers to condemn certain encumbrances and drawbacks associated with implementing the standard. The main source of resistance relates to the potentially cumbersome red tape. Another problem often raised relates to the contradictions between ISO 14001 and modern management trends. The pyramid logic of ISO 14001 reproduces the hierarchic structure and basic principles of traditional management systems. The final drawback is the cost and constraints dictated by the implementation of the standard and certification process. Costs are generated by the auditors' work, the time required for documentation, and efforts to comply to the letter with specifications in such areas as training and communication. According to some managers, these expenses will not necessarily mean less pollution, a better corporate image, or new contracts (Boiral and Sala, 1998).

2.3 ISO 14001 STANDARD AND AUSTRALIA

Australia has actively built its national infrastructure for implementing ISO 14001. There are three levels in the national infrastructure of ISO 14001 implementation in Australia. These levels are depicted in Figure 2.6. The "certification body" is the term used to designate the third-party auditing organizations, which certify organizations that seek certification. Accreditation bodies – The Joint Accreditation System of Australia and New Zealand (JAS-ANZ) evaluate the certification bodies. Organizations are defined as:

> *A company, corporation, firm, enterprise or institution or part or combination thereof, whether incorporated or not, public or private that has its own functions and administration* (Standards Australia/Standard New Zealand, 1996a, p.2)

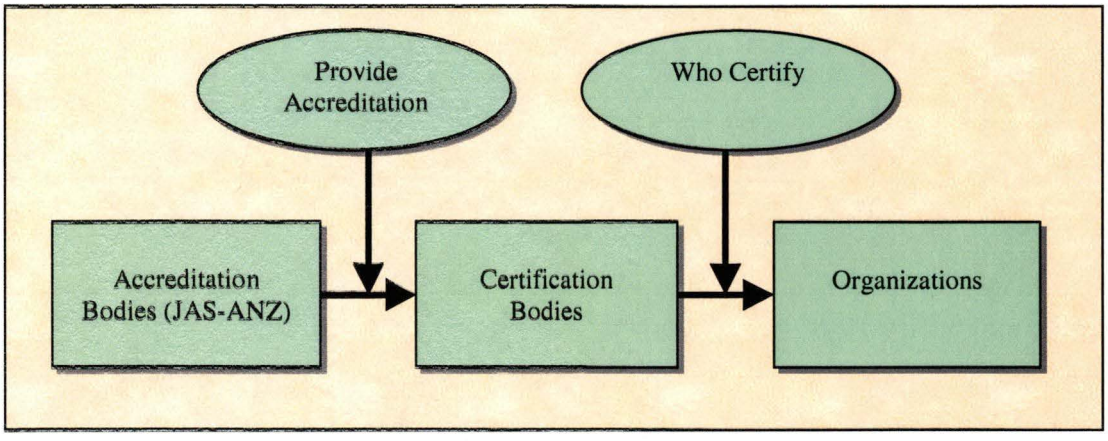

Figure 2.6 National Infrastructure of ISO 14001 Implementation in Australia

JAS-ANZ, which was established by a formal Agreement between the Governments of Australia and New Zealand (JAS-ANZ, 1999), has developed comprehensive criteria for ISO 14001 certification bodies. JAS-ANZ conducted a six-month pilot program to test the suitability of these criteria and initiated an accreditation program for providers of EMS certification in 1996 (Craddock and Cumming, 1996). Certification bodies will

need to have accreditation from JAS-ANZ for their certification of organizations to ISO 14001 to have official recognition. Certification within Australia is strictly controlled by the JAS-ANZ who licenses formally accredited organizations to certify organizations only where they have demonstrated industry experience.

An organization in Australia can seek ISO 14001 certification by hiring an accredited certification body to conduct a thorough audit. There is a long-term relationship between organization and certification body where certification is only a starting point, not a final goal. After an organization is successfully certified to ISO 14001, it will continue to be audited to ensure that the Environmental Management System is being maintained and improved over time. The typical certification process complies with the process outlined in Figure 2.5.

The Quality Society of Australia (QSA) is the registration body for environmental auditors in Australia. QSA led a working group to develop draft Selection Criteria for the Certification of Environmental Auditors. A Register of Certified Auditors (RCA) is in operation, with a Board of representatives from environmental associations, industry and academia, to oversee environmental auditing activities (Craddock and Cumming, 1996). Under JAS-ANZ accreditation guidelines, auditors for ISO 14000 certification cannot be involved in the EMS implementation in their own organization, nor sister organizations.

In March 2000, there were 587 sites certified for ISO 14001 in Australia. These 587 sites were spread across 199 companies (that is, some companies had more than one 'site' certified) in all States and Territories (JAZ-ANZ Register, 2000).

Figure 2.7 outlines the number of ISO 14001 certified sites and companies in different states. The highest number of companies and sites certified to ISO 14001 is found in New South Wales.

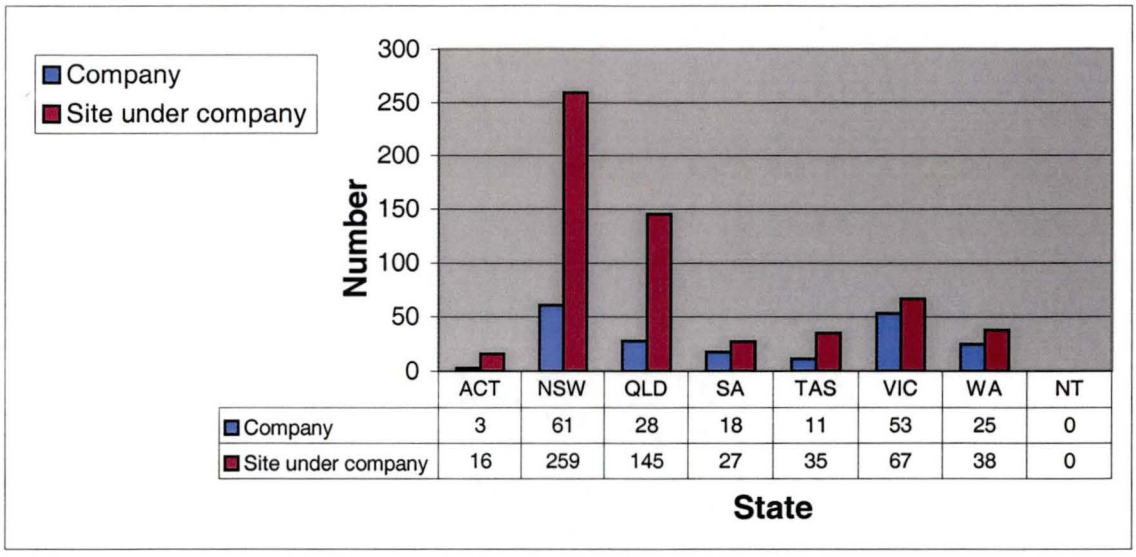

Figure 2.7 Number of ISO 14001 certified companies and sites in each state of Australia

Figure 2-8 shows the number of certified companies and sites in Australia between 1996 and 1999. The number of certified companies and sites increased with each year.

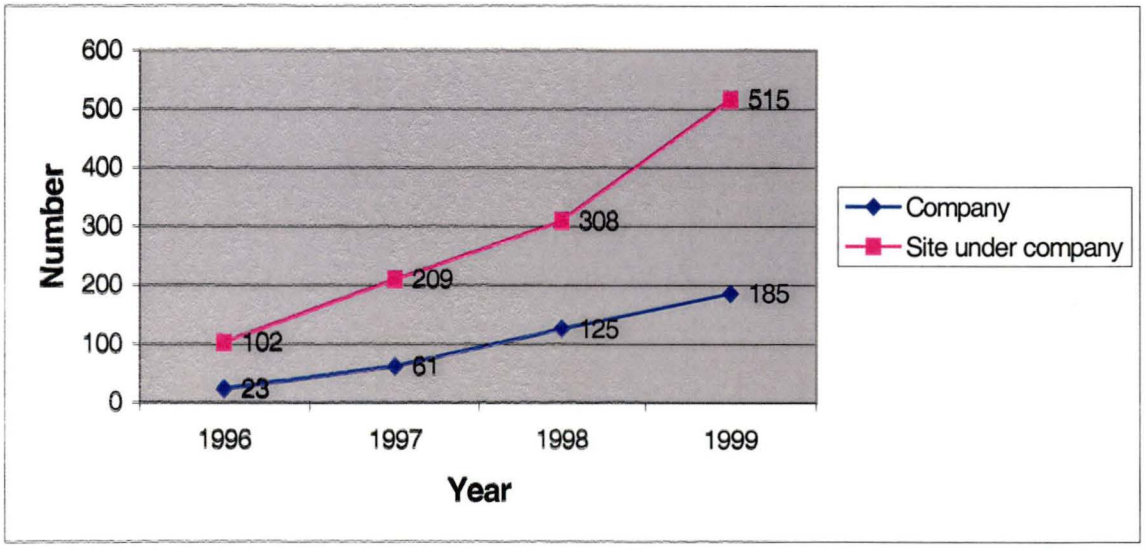

Figure 2.8 Number of ISO 14001 certified companies and sites* from 1996 to 1999 in Australia

* Sixty-two sites under 14 companies certified in 2000 or didn't provide certified year in JAS-ANZ Register list.

Figure 2.9 details the type of companies awarded ISO 14001 certification up to March 2000. This indicated that manufacturing comprises the largest fraction of certified companies.

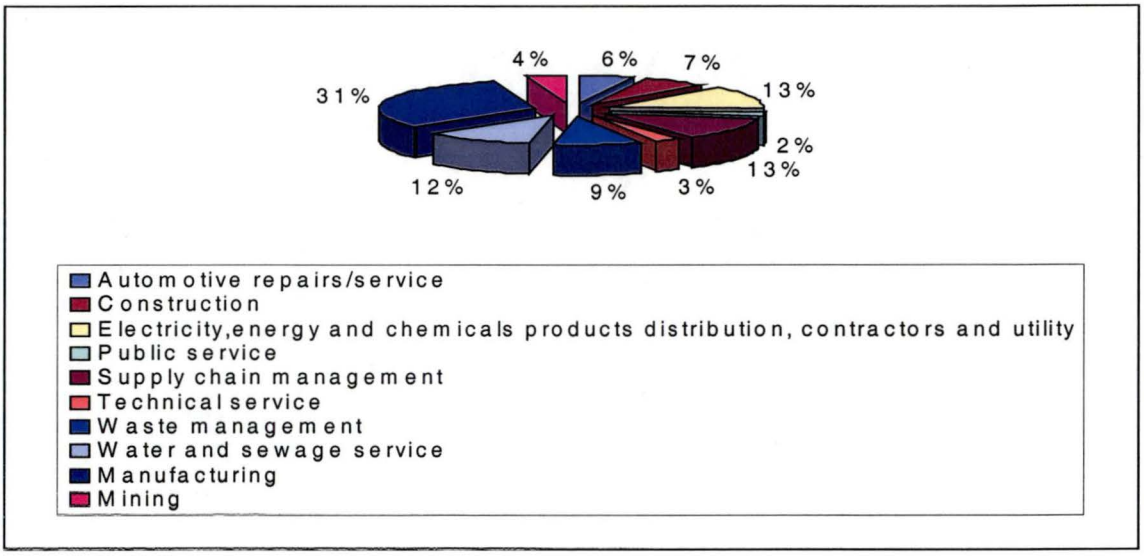

Figure 2.9 The certification type of companies awarded ISO 14001 in Australia

According to JAS-ANZ (2000), there are ten certification bodies in Australia accredited to provide ISO 14001 certification (see Table 2.5).

Table 2.5 ISO 14001 certification bodies in Australia (Source: JAS –ANZ, 2000)

The name of certification body
Bureau Veritas quality International – BVQI
Davis Langdon International – DLI
DNV Certification Pty Ltd – DNV
International Standards Certification Pty Ltd – ISC
KPMG Quality Certification Services – KQC
LRQA Australaisa – LRQA
NCS International Pty Ltd – NCSI
Quality Assurance Services Pty Ltd – QAS
SGS International Certification Services – SGS – ICS
Telarc Limited

Among the above 10 certification bodies, only 7 are currently participating in the certification market in Australia according to the JAS-ANZ Register list (2000). As shown in Figure 2.10, NCS International Pty Ltd. occupies more than half of the certification market in Australia.

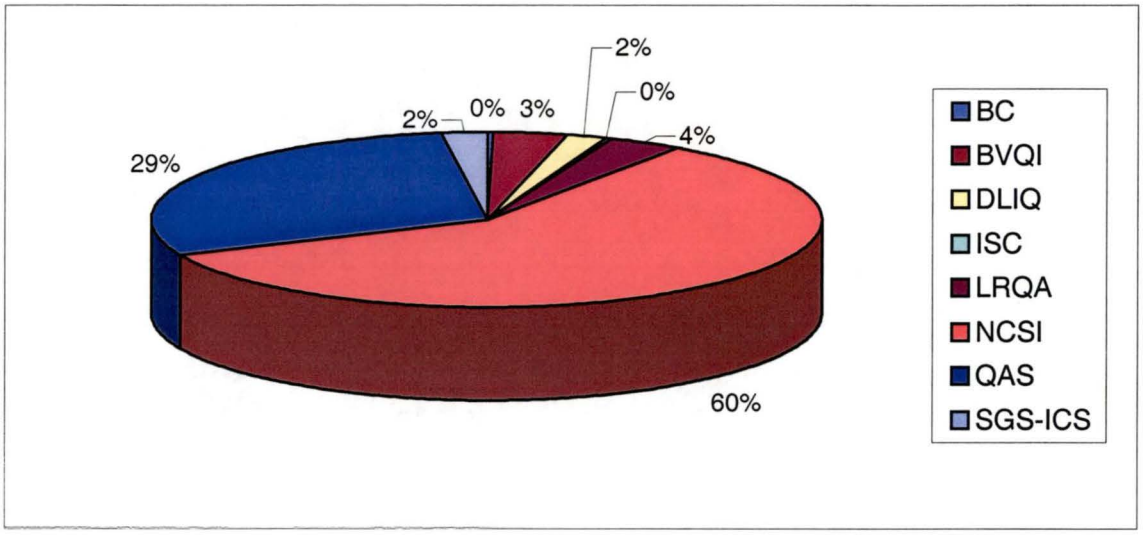

Figure 2.10 The percentage of occupied market of certification bodies* in Australia

Regulators in Australia have also begun to selectively target the most critical industries for licensing and industry self-regulation in order to shift companies towards a more effective regulatory system. ISO 14001 EMS standard have provided regulators with a powerful tool to move industry away from command and control toward self-regulation (Stone, 1998). In Victoria and New South Wales, special accredited licenses were created by the EPA. If a company meets the following three criteria (EMS in place, Auditing program, Public participation), then it may qualify for an accredited license that will allow some regulatory relief. Government will monitor companies to ensure that their targets are achieved. If not, the EPA may remove accredited licence and re-apply the normal permitting system to companies (ICF Incorporated, 1997).

* BC is not on the list of accredited certification bodies by JAS-ANZ. But one company was certified by BC according to JAS-ANZ Register list.

In order to gain a more comprehensive understanding of the current situation of ISO 14001 implementation in Australia, a survey was conducted by mailing out a questionnaire. The next chapter will describe the methodology of the mail survey.

Chapter 3 Methodology

This Chapter outlines the methodology used in this study. The four parts included are: questionnaire design, sample selection, data analysis and method limitations. Budgetary constraints eliminated the possibility of face to face and telephone interviews. The decision to use mail surveys was based on advantages of low cost and the widely geographically dispersed survey population (Babbie, 1992).

3.1 DESIGN QUESTIONNAIRE

Fowler (1988) suggested that more attention should be given to questionnaire design. The design of the questionnaire in this survey was aimed at a concise and clear survey form. A combination of closed and open-ended questions were used, both to keep the respondent interested and motivated to answer all questions, and allow them to express their own opinion freely on some occasions (Oppenheim, 1992). There were 21 questions included in the questionnaire. The reason for selecting questions such as asking about benefits and drivers of ISO 14001 implementation was to compare these results with the results of the previous studies. The reason for designing questions such as exploring critical opinions and difficulties of ISO 14001 implementation was to understand the lessons from the earlier adopters.

Following questions were designed for the mail survey:

Questions 1, 2, 3, 5, 6, 7, 8, 9, 10 and Question 19 sought general information about the certified company/site, such as certification type, certification year, main pollutants and environmental impacts, etc. Question 19 was an open-ended question.

Question 4 asked companies in Australia to report on where they believed sources of information on ISO 14001 could be found.

Question 11 asked respondents to give an importance rating to reasons for undertaking ISO 14001. The statements were a synopsis of the 6 reasons outlined in the literature (Meadows, 1998).

Questions 12 asked respondents to identify benefits from ISO 14001 implementation experienced by the organization. A synopsis of 10 benefits outlined in the literature (Lally, 1998) was the basis for the answer.

Question 13 asked respondents about the difficulties with the ISO 14001 adoption process. The question included a synopsis of 14 difficulties outlined in the literature (Mohammed, 2000).

Question 14 explored the cost of ISO 14001 implementation in Australia, which included approximate hours of work attributed to ISO 14001 by all staff, costs of staff training programs linked to ISO 14001, costs of publication of environmental statements, fees for external validation and fees for certification. The question also compared costs with benefits.

Question 15 asked respondents about the relationship between ISO 14001 with other ISO 14000 standards (Environmental Auditing - ISO 14010, 14011, 14012, Environmental Labelling - ISO 14020, 14021, 14024, Life Cycle Assessment - ISO 14040, 14041, Terms and Definition - ISO 14050).

Questions 16, 17 asked respondents about the senior management's involvement with the Environmental Management System and whether they believed that further environmental improvement was possible.

Questions 18, 20, 21 were open-ended background questions concerning the respondent's position; the respondent's responsibility for implementation of ISO 14001

and the respondent's critical opinions and suggestions on ISO 14001 implementation to regulators in Australia.

It is desirable to pre-test a questionnaire with several companies from the research population (Meadow, 1998). Due to considerations relating to time and cost, the questionnaire was pre-tested three times. Only three companies certified to ISO 14001 were chosen to participate in the pre-test in Tasmania. They were contacted by telephone, and all agreed to participate and provide feedback on the clarity of the questions and the extent to which the questions addressed the issues of drivers, benefits, costs and criticism of ISO 14001. Valuable feedback led to several changes in the detail and structure of the questionnaire.

3.2 SAMPLE SELECTION

The selection of the mail survey sample was based on the following criteria:

- The sample included all the companies that had been certified to ISO 14001 by March 2000 according to the list purchased from JAS-ANZ. All certified companies were surveyed in order to maximize the number of responses.

- The desired respondent was the person nominated on the JAS-ANZ register of certified companies as the point of public contact. The following approach was used when sending the survey questionnaire to the respondent.

    - If the company had just had one contact person, only one mail survey questionnaire would be sent.

    - If one company had more than one contact person for different sites, each person would be sent a mail questionnaire.

- If several different companies had the same contact person, only one mail survey questionnaire would be sent to this person. (It should be recognized that the responses might not exactly reflect all companies in this situation).

The JAS-ANZ register list contained 199 companies. The above selection criteria reduced this to 190 contact persons, which represented 199 companies and 587 sites across these companies. A total of 190 contact persons were sent the questionnaire in July, 2000.

3.3 DATA ANALYSIS

Data from the survey questionnaire was entered into EpiInfo6, SPSS, Microsoft Excel and Word Documents for analysis. Statistical software EpiInfo6, SPSS, Microsoft Excel were used to collect and determine quantitative results. Descriptive and qualitative explanations however, provided in response to questions were firstly collected and classified according to categories and sub-categories using Microsoft Word. For example, the position of respondent was initially categorized under a "section manager" heading and sub-categorized under:

- Assurance/technical manager
- Quality and environmental manager
- OHS, EMS and QA manager
- Engineering manager
- Health safety and environmental manager
- Quarry manager
- Technical manager
- Health safety and Environmental services officer
- Project and environmental manager
- Quality and environmental coordinator.

These results were analysed using the statistical software. An overall count of the frequency of responses in each category was made.

The environmental reports attached to the returned survey questionnaires from some of the responding companies will be analysed to support the discussion.

3.4 LIMITATIONS

The following factors should be noted as methodological limitations.

- Using the nominated public contact point provided by JAS-ANZ Register as the respondent: the research assumed that these respondents had sufficient information on the topics under investigation. It should be recognized that the responses might not reflect the level of the Board or the central office of the company but may represent only an individual view of the subject matter (Meadows, 1998).

- Mail surveys: One of the major problems using mail surveys is that they often have low response rate (Bailey, 1982). Reasons that may result in a low response rate include: (1) For most companies with limited financial and human resources due to economic constraints may not be able to participate in a non-profit mail survey, thus resulting in a non-response; (2) The importance of ISO 14000 to academic institutions involved in training professionals in this field, other surveys of ISO 14001 certified businesses are underway in Australia which might also cause a non-response; (3) Addresses from the JAS-ANZ Register, which are not always updated by those companies that are in a state of flux, will contribute to a non-response; (4) Companies who maintain a strictly confidential policy will not respond to this type of survey; and (5) Cost constraints may prevent the researcher from providing a returned envelope with a return postage stamp and restricted repeated contact with non-respondents.

The Human Research Ethics Committee, Research and Development Office of University of Tasmania approved the mail survey. The methodology is based on Meadows (1998) although the procedural details differed. The methodology can be replicated and the conclusions generalized from the survey results and previous research. The results from previous research aided in drawing conclusions.

Figure 3.1 shows the flowchart of methodology for this mail survey.

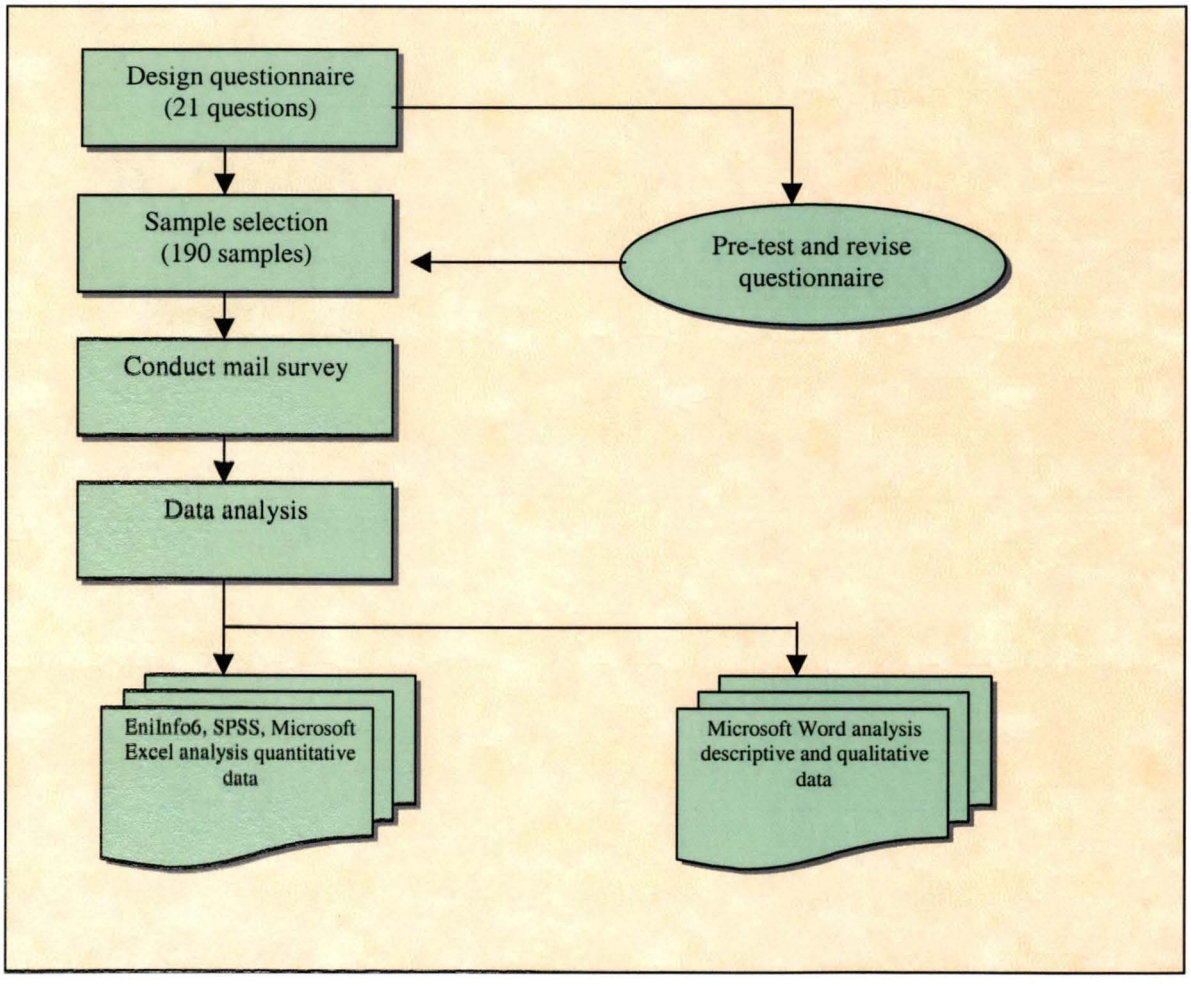

Figure 3.1 The flowchart of methodology

Chapter 4 Results

This chapter summarizes the results of the mail survey sent to Australian companies certified to ISO 14001. Interpretation of the data is based on the analysis of quantitative responses to the mail survey. Qualitative responses to questions are used to support and expand the understanding of the numerical data.

4.1 RESPONSE RATE

A total of 73 contact persons of the original 190 mail survey samples (representing 199 companies and 587 sites) responded to the questionnaire. The response rate was 38.4% (representing 36.7% companies and 50.9% sites). When this was adjusted to take account of 7 questionnaires that were not delivered, the response rate was about 40%. Table 4.1 outlines the response rate by different states. Interestingly, Tasmania has the highest response rate, which was 81.8%.

Table 4.1 Responses to the questionnaire by different states in Australia

State	Survey Sample (Number)	Represent Company (Number)	Represent Site (Number)	Survey Response (Number/Percentage)	Represent company (Number/Percentage)	Represent Site (Number/Percentage)
ACT	3	3	16	0 (0%)	0 (0%)	0 (0%)
NSW	61	61	259	24 (39.3%)	24 (39 3%)	173 (66 8%)
QLD	31	28	145	12 (38.7%)	12 (42 9%)	59 (40 7%)
SA	17	18	27	6 (35.3%)	6 (33 3%%)	12 (44 4%)
TAS	11	11	35	9 (81.8%)	9 (81 8%)	27 (77 1%)
VIC	42	53	67	16 (38.1%)	16 (30 2%)	19 (28 4%)
WA	25	25	38	6 (24.0%)	6 (24 0%)	9 (23 7%)
Total	190	199	587	73 (38.4%)	73 (36.7%)	299 (50.9%)

There is no agreed-upon standard for a minimum acceptable response rate of mail surveys (Fowler, 1988). According to Bailey (1992), a response rate of 50% is considered acceptable for mail surveys. The effect of non-response on survey results depends on the non-response rate and the bias of non-responders. Although the relatively low company response rate of this survey may indicate a bias in the results, it still represented 50.9% of sites in Australia that would reduce the overall bias. For this reason, the results of this survey should reflect the situation of ISO 14001 implementation in Australia.

4.2 THE GENERAL INFORMATION OF RESPONDING COMPANIES

This section provides general information about the businesses that responded to the questionnaire, based on questions 1, 2, 3, 5, 6, 7, 8, 9, 10 and question 19. The answers to these questions include information about the core business activities, certification type, certified year, type of pollution and environmental impact, and other information related whether the business had published an annual environmental report and previously attained ISO 9001.

Table 4.2 describes the core business activities of the responding companies based on question 1. The results indicated that most of them were manufacturing companies.

Table 4.2 Business activities of responding companies
(N: Number of respondents=66)

Business activity	Percentage
Construction	22.8%
Manufacturing*	50.0%
Water and Sewerage services	10.6%
Waste management	4.5%
Industry product distribution, contractor and utility (electricity, energy, chemicals)	9.1%
Public services	1.5%
Local government	1.5%
Total	100%

The results presented in Table 4.3 indicated that approximately 40% of certifications were based on the whole organization and approximately 40% were based on particular sites.

Table 4.3 ISO 14001 certification type of responding companies
(N =73)

Certification type	Percentage
Based on the whole company	45.2%
Based on the subsidiary company	13.7%
Based on the particular site/s	41.1%
Total	100%

Table 4.4 describes the ISO 14001 certified year of responding companies based on question 3. The majority of companies were certified in 1998 and 1999.

* Manufacturing includes the following fields: automotive glass, automotive component, chemicals, commercial furniture and product, slurry pump and process equipment, forestry and forest product processing, greasy wool scouring and top making, pharmaceuticals and health care products, carton packaging, printed circuit boards, agricultural chemicals, water meters, oil refining, paint, quarry products, packaging of wine, steel foundry, steel pipe and tube, document management solutions, wood processing, pest, manganese alloy smelter, chemical blending.

Table 4.4 The ISO 14001 certified year of respondents
(N =73)

Certified year	Percentage
1996	12.3%
1997	13.7%
1998	28.8%
1999	38.4%
2000	6.8%
Total	100%

Of the 73 responding ISO 14001 certified companies, 46.6% were international companies.

65.8% had ISO 9001 certification in place based on the whole company; 23.3% had ISO 9001 certification in place based on part of the company; and 11.0% did not have ISO 9001 certification in place.

36.1% had an EMS in place before gaining ISO 14001, and 63.9% did not have an EMS in place.

19.2% had paid environmental fines over the last 15 years; 74.0% had not paid environmental fines over the last 15 years; and 5.9% did not know if they had previously paid environmental fines. The amount of environmental fines ranged from A$240 to A$ 100,000.

52.1% had received previous complaints; 41.1% had no previous complaints; and 6.9% did not know if they had previously received complaints.

41.1% had published an annual environmental report, and 58.9% had not published an annual environmental report.

Table 4.5 details the main pollutants and environmental impacts of responding ISO 14001 certified companies. This result was based on the answer to open – ended question 19. In the 67 valid answers of the 73 responses, those described pollutants and environmental impacts that were identified included wastewater emission, waste air emission, noise, solid waste residue, chemical and others. The most frequently mentioned pollutants and environmental impacts were wastewater emission and solid waste residue.

Table 4.5 Main pollutants and environmental impacts of responding companies
(N=67)

Main pollutants and environmental impacts		Percentage
Wastewater emission	Spilled oil, diesel, petrol, herbicides, leakage (groundwater contamination), wood residues, BOD, SS, E-coli, sewage. Screen print and spray paint solvents, heavy metals, ammonia, grease, biosolids treated wastewater effluent, storm water runoff	53.7%
Waste air emission	Odour, energy use/greenhouse gas, NOx, acid sulphate, landfill gas, volatile organic compounds	32.8%
Noise	Noise and vibration	25.4%
Solid waste residue	Dust, sediment, construction waste materials, foundry sands and slogs, silt, sludge, empty paint tins, packing, paint fumes, rejected plastics, paper and cardboard, packaging plastic, rubbish, hazard and dangerous goods	53.7%
Chemicals	Hydrocarbon, dioxin, chemical spills (CL2), agricultural chemicals – spillage, offsite drift, PCBs, storage of bulk chemicals, PM10, waste HCL, heavy metals	22.4%
Others	Resource consumption –electricity , gas, water, bushfires	17.9%

4.3 SOURCE OF INFORMATION FOR ISO 14000 SERIES AMONG COMPANIES

This section provides a summary of the responses on the sources of information used by companies about the ISO 14000 series based on question 4.

Figure 4.1 shows the sources of information used during or before implementing ISO 14001 in Australia. None of the responding companies derived information from local media or TV. Only 6.8% were informed via NGOs; 16.4% via government departments; 58.9% via Standards Australia; 28.8% via ISO; and 17.8% were informed via industry associations. From the responding companies, 34% derived information from other sources, such as consultants, British Standard, Castings Development Centre, a certifying body (e.g. NATA and NCSI), clients, corporate environmental initiatives, corporate head office, course information, certified customers, international companies, internet, purchased books and tapes, quality auditors, training providers, and/or tenders/contractors. The most useful source of information for ISO 14000 series standards was Standards Australia.

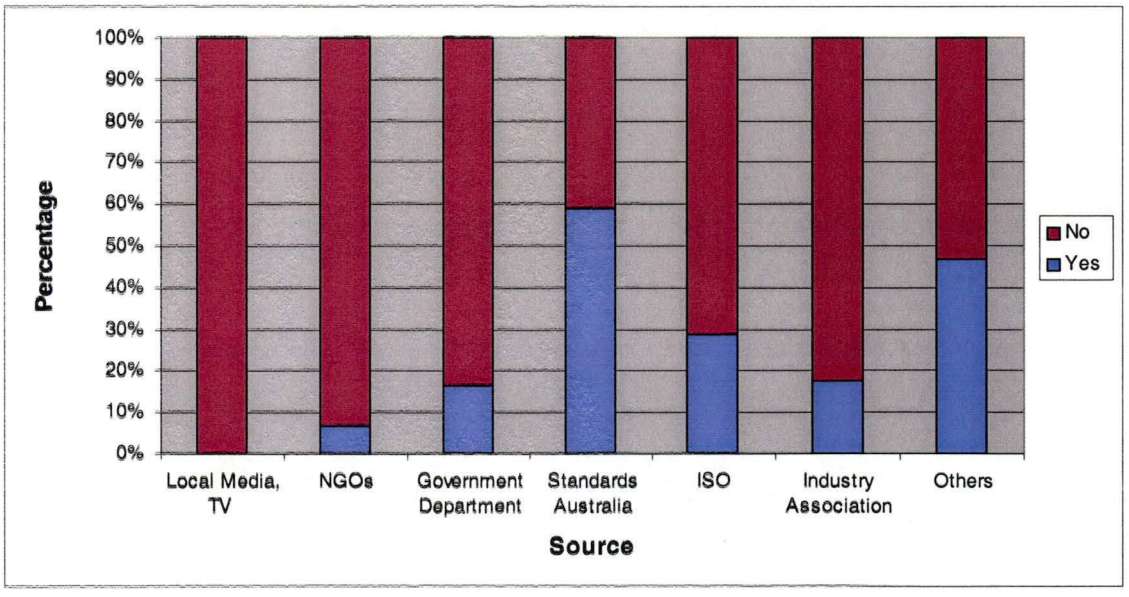

Figure 4.1 Source of information for ISO 14000 series standards
(N=73)

4.4 MAIN REASONS FOR IMPLEMENTING 14001

This section documents the main reasons for implementation of ISO 14001 as indicated by those companies responding to question 11. The respondents were asked to rate, on a scale of 1 to 4, the reasons for implementing ISO 14001. These reasons were selected based on Meadows thesis (1998) and will be discussed in more detail in the next chapter.

Table 4.6 outlines the main reasons for companies in Australia to pursue ISO 14001. The most important reasons included improving environmental performance, enhancing due diligence and improving regulation compliance.

Table 4.6 Main reasons for companies in Australia to pursue ISO 14001
(N=72)

Category Reasons	Subcategory Reasons	Percentage			
		Very important	Important	Neither important nor unimportant	Not important
Organizational	To formalize support for environmental programs within the organization	30.6%	48.6%	13.9%	6.9%
	To standardize environmental activities within the organization	20.8%	50%	23.6%	5.6%
	To enhance due diligence	65.3%	23.6%	6.9%	4.2%
Financial	To control costs	20.8%	25.0%	22.2%	31.9%
	To reduce insurance premium	5.6%	29.2%	23.6%	41.7%
	To get better access to finance	1.4%	9.7%	38.9%	50.0%
Environmental	To improve environmental performance	68.1%	27.8%	2.8%	1.4%
	To conserve materials and energy	32.4%	45.1%	18.3%	4.2%
Regulatory	To influence government regulatory change	9.7%	18.1%	45.8%	26.4%
	To improve knowledge of regulations	25.0%	51.4%	16.7%	6.9%
	To improve regulation compliance	61.1%	27.8%	4.2%	6.9%
Competitive Advantage	To improve access to Australian markets	19.4%	26.4%	27.8%	26.4%
	To improve access to international markets	18.8%	10.1%	21.7%	49.2%
	To improve marketing opportunities	36.2%	31.9%	15.9%	15.9%
Public Relation	To meet customers expectations	41.7%	36.1%	15.3%	6.9%
	To improve public relations	30.6%	48.6%	13.9%	6.9%
	To meet community expectations	40.3%	37.5%	18.1%	4.2%

4.5 POTENTIAL BENEFITS FOR IMPLEMENTING ISO 14001

This section provides results of the potential benefits for implementing ISO 14001 based on question 12. The question allowed open-ended responses which were coded in line with reasons outlined in the literature (Lally, 1998).

Table 4.7 shows the potential benefits for companies in Australia by implementing ISO 14001. The obvious benefits according to the survey are "It had changed management's environmental awareness"; "It had improved the management system for environmental accidents and risks"; "It had improved the internal environmental management methods"; "It had promoted compliance with existing national and state laws"; and "It had improved the organization's environmental performance".

Table 4.7 Potential benefits for companies by implementing ISO 14001 (N=70)

Potential benefits	Percentage
It had changed management's environmental awareness	86.3%
It had improved the management system for environmental accidents and risks	83.5%
It had improved the internal environmental management methods	78.0%
It had promoted compliance with existing national and state laws	78.0%
It had improved the organization's environmental performance	76.7%
It had improved public relations	61.7%
It had enhanced employee's environmental capacity building	53.4%
Its adoption was cost-effective and productivity had improved	24.7%
It had encouraged other environmental initiatives	24.7%
It had attracted Green consumers and gained competitive advantage in the market	19.2%

4.6 DIFFICULTIES FACED IN ADOPTING ISO 140001 BY ORGANIZATIONS

This section highlights those difficulties faced in adopting ISO 14001 by companies based on question 13. The respondents were asked to rate the level of difficulties that

were mentioned in the literature (Mohammed, 2000) from "no difficulty" to "high difficulty".

Figure 4.2 indicates those difficulties faced in adopting ISO 14001. Of the 70 valid responders, the time consumption was the biggest problem during the implementation of ISO 14001 (64.3%). Documentation (35.7%), staff training (37.1%), monitoring/ measurement (38.6%), cost for ISO implementation (37.1%), consultants costs (32.9%), setting objectives and targets (31.9%) were rated as "relatively high difficulty". System review (28.6%), new structure and responsibilities (15.9%), defining the priorities for action (17.1%), auditing (18.6%), defining the environmental policy (8.6%) and communication internal/external 16.2% were rated as "less difficult".

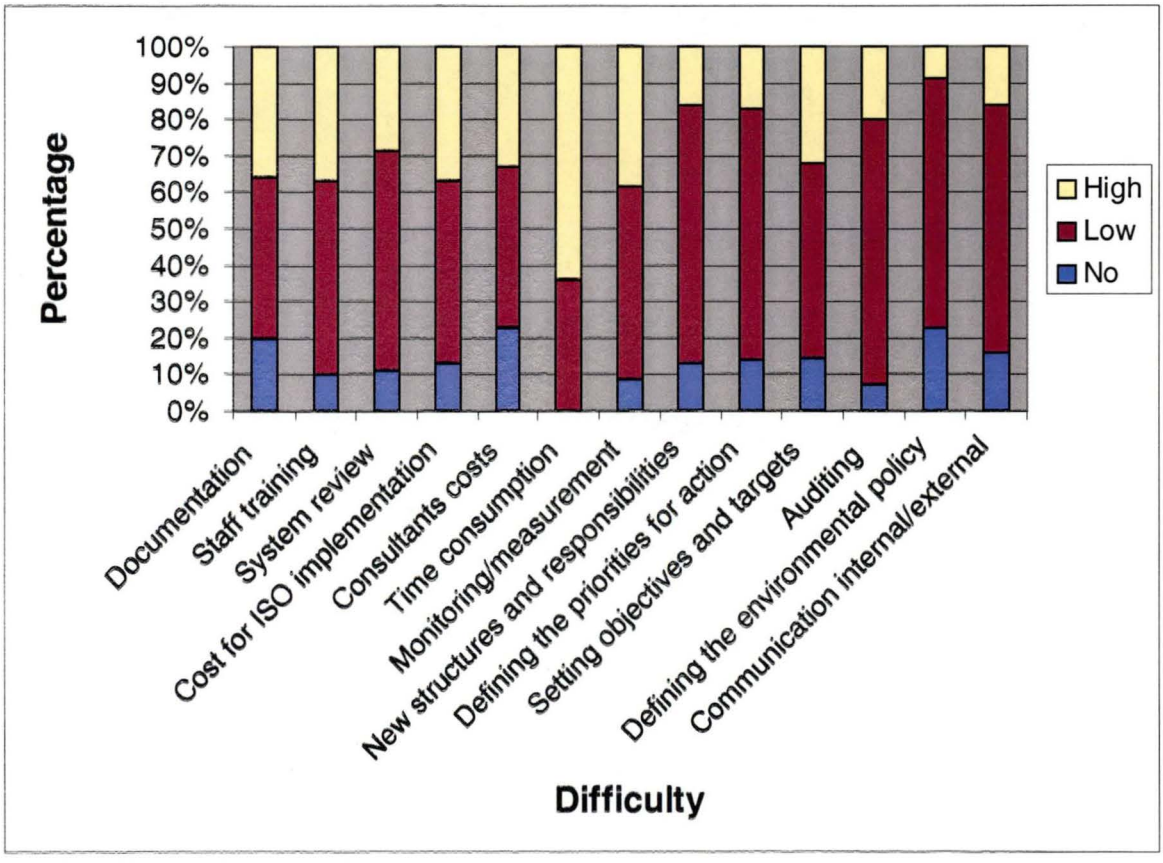

Figure 4.2 Difficulties faced in adopting ISO 14001 by companies

(N=70)

4.7 COSTS OF IMPLEMENTING ISO 14001

This section assesses the information on cost of implementing ISO 14001 based on question 14. The costs include approximate hours of work attributed to ISO 14001 by all staff; costs of staff training programs linked to ISO 14001; costs of publication of environmental statements; and fees for external validation and certification. The question also compared costs with benefits.

Table 4.8 indicates that the approximate hours of work attributed to ISO 14001 by all staff ranged from 100 hours to 10,000 hours with a mean of 1,382 hours and median value of 500 hours. The total amount of other fees was from A$2,100 to A$1,511,500 with mean costs of A$470,030 and median value of A$1,800.

Table 4.8 The costs of ISO 140001 implementation in Australia

Costs of implementing ISO 14001 in Australia	Range	Mean	Median
Approximate hours of work attributed to ISO 14001 by all staff (N=35)	100~10,000hr	1,342hr	500hr
Total	**100~10,000hr**	**1,342hr**	**500hr**
The costs of staff training programs linked to ISO 14001 (N=34)	A$500~15,000,000	A$450088	A$5,000
The cost of publication environmental statements (N=14)	A$100~50,000	A$6,514	A$1,000
Fees for external validation (N=41)	A$1,000~35,000	A$7,959	A$4,000
Fees for certification (N=36)	A$500~30,000	A$5,469	A$1,800
Total	**A$2,100~1,511,500**	**A$470,030**	**A$11,800**

Figure 4.3 compares the estimated costs of ISO 14001 certification with the potential benefits. According to the survey, 52% thought that costs were less than benefits; 36% thought that costs were greater than benefits; and 12% thought costs were equal to benefits.

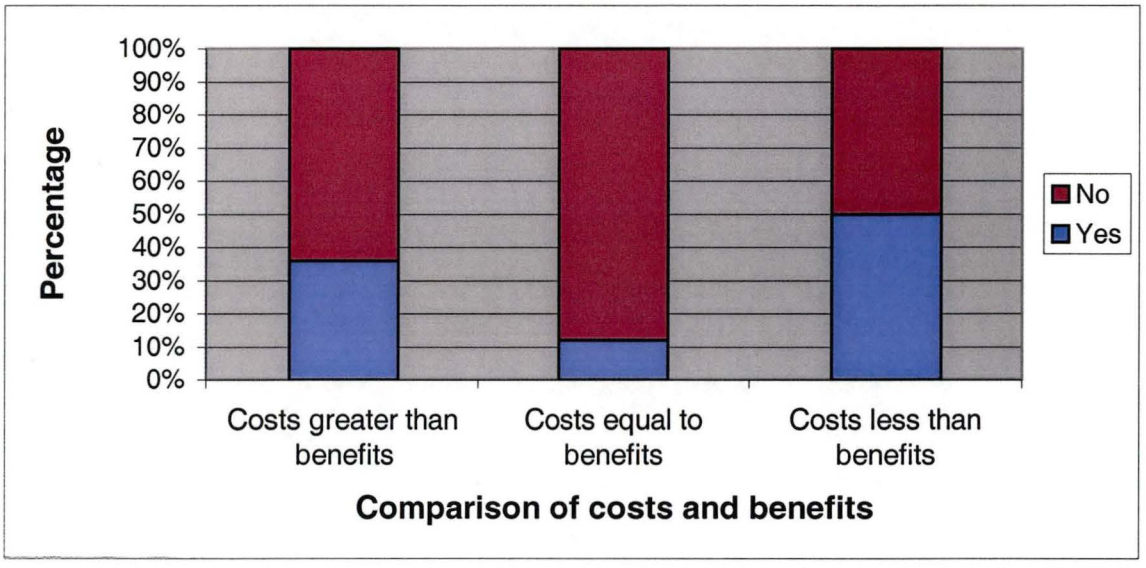

Figure 4.3 **Comparison of the estimated costs of ISO 14001 certification with the potential benefits**
(N=50)

4.8 THE SUPPORT OF OTHER ISO 14000 STANDARDS FOR ISO 14001 IMPLEMENTATION

This section outlines the extent to which other ISO 14000 standards provided support for ISO 14001 implementation based on responses to question 15. As shown in Figure 4.4, 72.6% reported that Environmental Auditing (ISO 14010, 14011, 14012) was useful to ISO 14001 implementation. A very low percentage of respondents thought that Environmental Labelling (ISO 14020, 14021, 14024), Life Cycle Assessment (ISO 14040, 14041) and Terms and Definition (ISO 14050) were useful to ISO 14001 implementation. The results indicate that Environmental Auditing was more useful to ISO 14001 implementation in Australia compared to other standards.

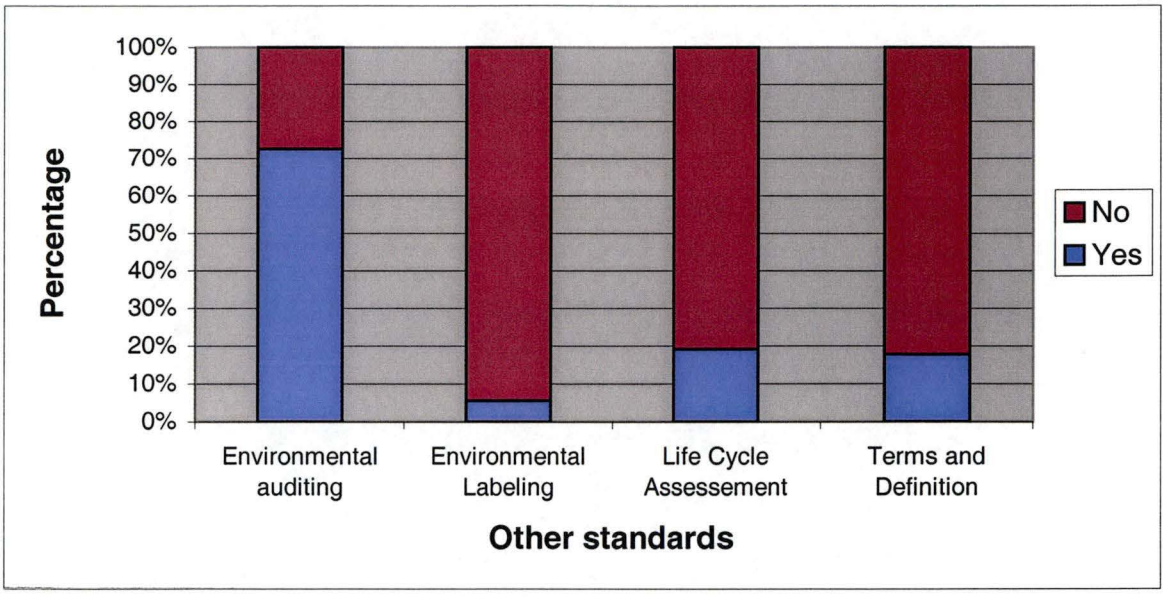

Figure 4.4 Support of other ISO 14000 standards for ISO 14001 Implementation
(N=73)

4.9 THE TIME PERIOD FOR THE SENIOR MANAGER TO REVIEW THE ENVIRONMENTAL MANAGEMENT SYSTEM OF THE COMPANY

This section presents an overview of the time interval that senior managers review the environmental system of the companies based on responses to question 16. As shown in Figure 4.5, of 70 valid responders, 40.0% reported that their senior managers review their Environmental Management System every 6 months; 35.7% indicated that their senior managers review their Environmental Management System every 12 months. The results clearly suggest that most companies review their Environmental Management System every 6 months or 12 months.

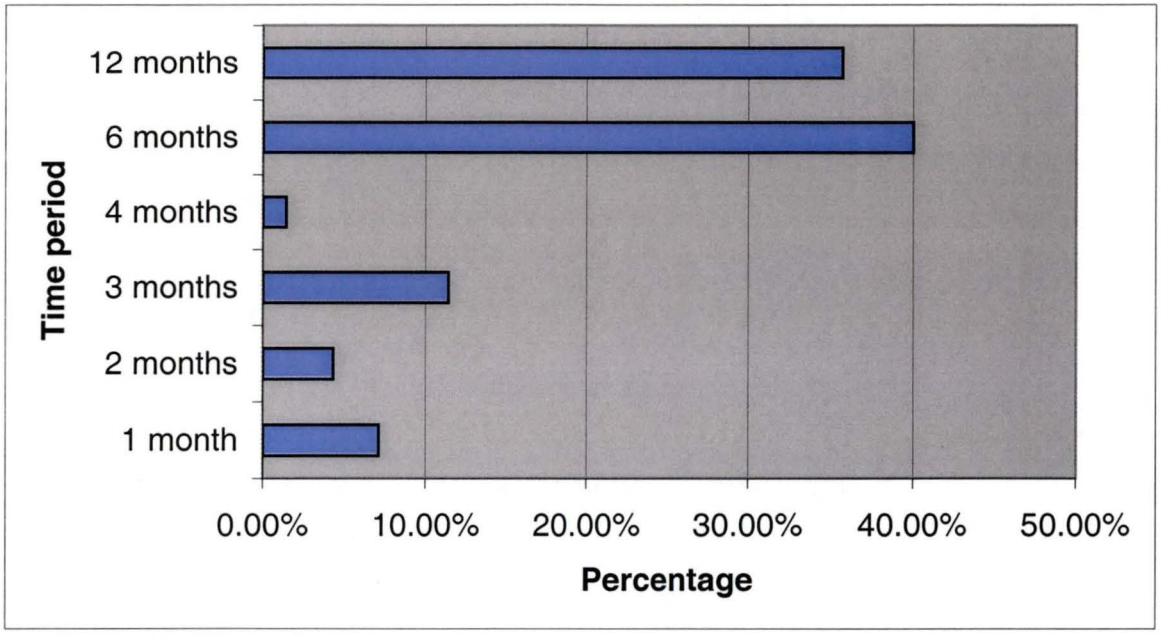

Figure 4.5 The time period for the senior manager to review the Environmental Management System of the company

(N=70)

4.10 FURTHER ENVIRONMENTAL IMPROVEMENT

This section provides information on the possibility of further improvement based on responses to question 17. According to the survey, 100% of the 72 respondents thought that further environmental improvement was possible.

4.11 THE POSITION OF RESPONDENTS

This section provides information on the position held by the person completing the questionnaire based on responses to open – ended question 18. Table 4.9 shows that 77.5% respondents were "Section Managers" compared with other positions. From the results it can be concluded that "Section Managers" were the most likely person to respond to the implementation of EMS within the company.

Table 4.9 The position of respondents
(N=71)

Position		Percentage
General Manager	General manager	8.5%
	Director	
Section Manager	Assurance/technical manager	77.5%
	Quality and environmental manager	
	OHS and EMS and QA manager	
	Engineering manager	
	Health safety and environment manager	
	Quarry manager	
	Technical manager	
	Safety health and environmental services officer	
	Project and environmental manager	
	Quality and environmental coordinator	
Consultant	Integrated management system consultant	2.8%
Principal Chemist	Principal chemist	1.4%
Engineer	Chemical and environmental engineer	5.6%
	Process engineer	
Representative	Environmental representative	4.2%
	QA representative	
Total		100%

4.12 THE CRITICAL OPINION AND RECOMMENDATIONS OF ISO 14001 IMPLEMENTATION

Forty-three respondents answered open-ended question 20 and provided critical opinions. Forty-seven respondents answered open-ended question 21 and provided

recommendations to ISO 14001 implementation in Australia. This will be discussed in the next chapter.

The next chapter examines the research findings and attempts to discuss several questions related to the implementation of ISO 14001 in Australia.

Chapter 5 Discussion

This chapter examines the research findings, and discusses three questions. Firstly, what are the most important reasons for companies in Australia to adopt ISO14001; Secondly, what are the costs and benefits of ISO 14001 implementation in Australia; and finally, what are the problems of ISO 14001 implementation in Australia?

5.1 WHAT ARE THE MOST IMPORTANT REASONS FOR COMPANIES IN AUSTRALIA TO ADOPT ISO 14001 AT PRESENT?

According to this survey, the three most important reasons for companies in Australia to implement ISO 14001 are: improving environmental performance (68.1%); enhancing due diligence (65.3%); and improving regulation compliance (61.1%).

It is interesting to compare these results with the results of Meadows' survey in 1997 (see Table 5.1). Since the results of Meadows survey represented 84% certified companies and 76% certified sites by the end of 1997. The results of this survey targeted more companies and as such better reflects the current situation of ISO 14001 implementation in Australia.

From Table 5.1, based on the ranking "very important", it is evident that the first and second most important reasons identified by this survey comply with those identified in Meadows' survey. "To meet community expectations" is no longer equal second most important reason for adopting ISO 14001 in Australia, dropping to fifth. "Improving regulatory compliance" became the third most important reason in this survey. If "very important" and "important" are combined, this study did not change the ranking of the first three reasons stated in Meadows (1998).

Table 5.1 The comparison of reasons for adopting ISO 14001 in Australia between this survey (2000) and Meadow's survey (1997)

Reasons	This survey, 2000				Meadows' survey, 1997			
	1	2	3	4	1	2	3	4
To improve environmental performance	68.1%	27.8% **(95.9%)**	2.8%	1.4%	66.7%	22.2% **(88.9%)**	11.1%	0%
To enhance due diligence	65.3%	23.6% **(88.9%)**	6.9%	4.2%	52.8%	44.4% **(97.2%)**	2.8%	0%
To improve regulation's compliance	61.1%	27.8% **(88.9%)**	4.2%	6.9%	50.0%	38.9% **(88.9%)**	11.1%	0%
To meet customers expectations	41.7%	36.1% **(77.8%)**	15.3%	6.9%	44.4%	30.6% **(75.0%)**	22.2%	2.8%
To meet community expectations	40.3%	37.5% **(77.8%)**	18.1%	4.2%	**52.8%**	36.1% **(88.9%)**	5.6%	5.6%
To improve marketing opportunities	36.2%	31.9% **(68.1%)**	15.9%	15.9%	44.4%	36.1% **(79.5%)**	16.7%	2.8%
To conserve materials and energy	32.4%	45.1% **(77.5%)**	18.3%	4.2%	22.2%	47.2% **(69.4%)**	30.6%	0%
To improve public relations	30.6%	48.6% **(79.2%)**	13.9%	6.9%	41.7%	47.2% **(88.9%)**	11.1%	0%
To formalize support for environmental programs within the organization	30.6%	48.6% **(79.2%)**	13.9%	6.9%	27.8%	61.1% **(88.9%)**	8.3%	2.8%
To improve knowledge of regulations	25.0%	51.4% **(76.4%)**	16.7%	6.9%	19.4%	41.7% **(61.1%)**	22.2%	16.7%
To standardize environmental activities within the organization	20.8%	50% **(70.8%)**	23.6%	5.6%	30.6%	44.4% **(75.0%)**	22.2%	2.8%
To control costs	20.8%	25.0% **(45.8%)**	22.2%	31.9%	16.7%	30.6% **(47.3%)**	36.1%	16.7%
To improve access to Australian markets	19.4%	26.4% **(45.8%)**	27.8%	26.4%	27.8%	25.0% **(52.8%)**	36.1%	11.1%
To improve access to international markets	18.8%	10.1% **(28.9%)**	21.7%	49.2%	22.2%	19.4% **(65.6%)**	47.2%	11.1%
To influence government regulatory change	9.7%	18.1% **(27.8%)**	45.8%	26.4%	13.9%	38.9% **(52.8%)**	33.3%	13.9%
To reduce insurance premium	5.6%	29.2% **(34.8%)**	23.6%	41.7%	0	30.6% **(30.6%)**	41.7%	27.8%
To get better access to finance	1.4%	9.7% **(11.1%)**	38.9%	50.0%	5.6%	16.7% **(22.3%)**	47.2%	30.6%

Note: 1-very important, 2-important, 3-neither important nor unimportant, 4-not important. The number in brackets in column 2 is the sum of columns 1 and 2. "⟵" means significantly increasing importance with respect to this survey. "⟵ - -" means slightly increasing importance with respect to this survey. "⟵" means significantly decreasing importance with respect to this survey. "⟵ - -" means slightly decreasing importance with respect to this survey.

The change from 1997 to 2000 could be explained by assuming that more companies in Australia are realizing that the costs of failing to comply with environmental regulation are high. For example, 19.2% of responding companies in this survey have paid environmental fines over the last 15 years. The amount of environmental fines ranged from A$240 to A$100,000. The desire to comply with government regulation and avoid costs associated with non-compliance seem to have become more important for the implementation of ISO 14001 in Australia. One respondent said: *"ISO 14001 application is useful. Not as many companies are aware of its usefulness, until faced with legal and regulatory action."*

This trend in reasons for adopting ISO 14001 also indicated that, from a business perspective, the community and public are still not very familiar with ISO 14001 in Australia. This is due to respondents rating "To meet community expectation" as "less important". To some degree, this suggests that governments do not support promotion of this standard enough. According to this survey, only 16.4% gained ISO 14001 information from government departments. None of these companies obtained information from local media and/or TV. One respondent said:

> *"In Australia companies will take on ISO 14001 for internal value (unless they already have a poor record). In general, the public, customers or government departments do not value the ISO 14001 certification and therefore do not grant companies that have achieved it any special considerations."*

This might explain why "To meet community expectation" was viewed as less important in this survey. It appears that the government must find some effective tools to keep people informed and enthusiastic about ISO 14001. If not, the companies might lose interest in maintaining ISO 14001 certification.

In 1997, 11.1% of respondents indicated that "To improve international markets" was not important, but by 2000, this had shifted to 49%. This suggests that the businesses were open-minded in 1997, but has since found that this is not of a significant benefit. There are similar trends for reducing insurance premium (a significant increase in "not important" in 2000), and accessing to finance (again, more indicate "not important"). It is interesting to note that 4 companies (4.6%) stated that the reduction of insurance premium was very important in 2000 compared to 0% in 1997. Perhaps a few companies are gaining benefits in this area.

As outlined in Chapter 2, "competitive reasons" was listed as one of the most important reasons for companies to implement ISO 14001. It seems that many companies in Australia adopt ISO 14001 far more for environmental reasons than for any other purpose. This is illustrated in Table 5.2 which groups the subcategory reasons into 6 categories as shown in Table 4.6 and outlines the mean percentage for each category. It indicated that just 24.8% rated competitive reasons to be the most important.

Table 5.2 The comparison of different reasons for implementing ISO 14001 in Australia

Reasons	Mean			
	Very important	Important	Neither important nor unimportant	Not important
Environmental reasons	50.3%	36.5%	10.6%	2.8%
Organizational reasons	38.9%	40.7%	14.8%	5.6%
Public relation reasons	37.5%	40.7%	15.8%	6.0%
Regulational reasons	31.9%	32.4%	22.2%	13.4%
Competitive reasons	24.8%	22.8%	21.8%	30.5%
Financial reasons	9.3%	21.3%	28.2%	41.2%

The difference between the current survey results and previous literature may be explained that many articles referenced in the literature review are from the U.S., Europe and Japan. In these countries, the competitive reason is more important. For instance, in a 1995 survey of 99 U.S. businesses considering ISO 14001 implementation, 50% reported "customer demand" or "competitive advantage" as the

reason for certification. In Europe, "green" is one of most important reasons for people to purchase a product (Lally, 1998). Further, in Japan, the prevalence among manufacturers to adopt ISO 14001 outpaced a similar movement among Japanese suppliers, opening the market to ISO 14001 certified foreign suppliers (Lally, 1998). In Australia, the competitive reasons are not very obvious at the moment compared to these countries. As one respondent wrote:

> *"ISO 14001 is a completely unmarketable name. ISO 14001 means nothing to any consumer."* Another organization mentioned: *"We regularly compete against non certified companies for tenders and price always wins. (The mentality has not changed)."*

5.2 WHAT ARE THE COSTS AND BENEFITS FOR ISO 14001 IMPLEMENTATION IN AUSTRALIA?

5.2.1 Costs

According to the results of this survey (see Table 4.8), the approximate hours of work attributed to ISO 14001 by all staff within a business ranged from 100 hours to 10,000 hours with a mean of 1,342 hours and median value of 500 hours. The total of other fees ranged from A$2,100 to A$1,511,500 with mean costs of A$470,030 and median value of A$11,800. If it is assumed that the payment of all staff per hour is A$30[*] (including senior staff, middle level staff and junior staff), the total costs of ISO 14001 implementation in Australia would range from A$5,100 to A$1,541,500, with a mean value of A$510,290 and median value of A$26,800 per year.

From Table 4.7, it is apparent that staff time and the staff training program costs were the largest component of total costs for ISO 14001 implementation.

[*] This is an arbitrary number introduced to illustrate the relative costs of staff and other costs

It is difficult to compare these detailed costs with the published literature because this aspect of ISO 14001 is rarely discussed. However, it is possible to compare the total costs for implementation and certification. As discussed in Chapter 2, Stenzel (2000) stated that total fees ranged from $100,000 to $1 million for large industries and between $10,000 and $100,000 for small and medium industries. According to this survey, it is a range from A$5,100 to A$1,541,500 and median value is A$26,800. This is consistent with the figures mentioned in Stenzel (2000). However, the costs are very different from one company to another. It depends on many factors such as how many sites were certified and how many programs were implemented.

5.2.2 Benefits

According to the survey (Table 4.7 in Chapter 4), the most common benefits for implementing ISO 14001 in Australia were: "It had changed management's environmental awareness (86.3%)"; "It had improved the management system for environmental accidents and risks (83.5%)"; "It had promoted compliance with existing national and state laws (78%)"; "It had improved the internal environmental management methods (78%)"; and "It had improved the organization's environmental performance (76.7%)". It is interesting to find that, in Australia, the most commonly mentioned benefits were internal benefits that companies enjoy for pollution prevention and compliance assurance. It was obvious that market reasons were not viewed as a common benefit.

The above benefits identified in the current survey are further supported by the following quotes from company environmental reports attached with the questionnaire:

- It had changed management's environmental awareness---Example from ENERGEX: ENERGEX manages a $2.2 billion electricity distribution network and gas network, which extends throughout South-east Queensland and northern New South Wales. It retails electricity and gas to more than one million customers across Australia. They report:

> *"ENERGEX conducts environmental awareness training for staff and contractors. We updated our environmental awareness course during the year to include their new gas operations. As of July 1999 1,500 staff and contractors had completed the course. In addition, two specific awareness courses were formalized - on oil spill management and declared (noxious) weeds. The weed course was developed in consultation with Queensland Department of Natural Resources and the spill course was developed in consultation with Queenland Electricity Supply Industry. Completion of these courses is now a required competency for many staff and* contractors". (Energex , 1999, p.16)

- It had improved the organization's environmental performance---Example from SOUTH EAST WATER: SOUTH EAST WATER is a State-owned company and provides water and sewage services to customers in the southeast of Melbourne. They described in their environmental report:

> *"We have achieved sound environmental performance during 1998/99. The following summary shows that we achieved 32 of the 36 Environment Improvement Plan targets, and all 12 of the State Environment Protection Policy targets. The targets have been set as a part of an extensive program to generate continual improvement in our environmental performance. Targets not met were almost achieved and will continue to monitor closely. In addition, the excellent performance of the Sewage Treatment Plants meets 100% of all waste discharge licensee requirements. The results reflect both our commitment to continuous improvement, and to the Quality and Environmental Management Systems."*(South East Water, 1999, p.2)

- It had improved the management system for environmental accidents and risks--Examples from TXU: TXU is one of the largest investor-owned services companies in the world with assets of over US$40 billion. TXU in Australia holds a unique position in Victoria, as one of only two companies with significant capabilities to provide customers with both natural gas and electricity. It reported:

> *"The number of environmental incidents, such as oil spills, was reduced by over 50%. Resultant environmental damage from incidents was minimized due to employees and contractors being aware of how to respond to such and by being appropriately trained."* (TXU, 1999, p.2)

- It had promoted compliance with existing national and state laws---Examples from GoldCoastWater: GoldCoastWater plays a key role in protecting the waterways of the city of Gold Coast and associated environment through their stewardship of products and services. They indicated in their report:

> *"The Environmental Protection Agency issued new licenses for the wastewater treatment plants on 22 June 1999. The previous licenses set 80th percentile compliance limits for the concentrations of contaminants in the plant effluents. All wastewater treatment plants met their license requirements of compliance with the 80th percentile limits for contaminants."* (GoldCoastWater , 1999, p.12)

- It had improved the internal environmental management methods---Example from THIESS: THIESS is one of Australia's leading engineering and construction companies, THIESS Contractors Pty Limited provides services in civil engineering, contract mining, building construction, process engineering and environmental services. Their report indicates:

> *"THIESS uses significant quantities of diesel in our mining operations. For 1998/99 we have carried out an internal study comparing energy consumption and emissions of greenhouse gases across eight of our major contract mining projects in Australia. The analysis indicates that THIESS' energy consumption is in line with industry benchmarks. In 1999/2000 THIESS is developing a greenhouse gas management strategy."*
> (THIESS, 1999, p.18)

5.2.3 Comparing costs and benefits

From the results reported in Chapter 4, it is apparent that while a majority of respondents for this survey believed that the costs of implementing ISO 14001 were less than the benefits in Australia, a significant number (36%), however, did not. A business that is losing money on an activity will either drop that activity, or seek ways of reducing costs/increasing benefits.

Costs and benefits of the Environmental Management System can be difficult to measure. How do you measure the value of a preventive system? The costs incurred in the course of complying with regulations such as monitoring and permit requirements are potentially hidden among other items, such as overheads. Intangibles such as enhanced consumer response indeed have value, but that value may depend on how the company is currently positioned on these issues as well as the company's goals (Graff, 1997).

It is possible, that when judging costs and benefits, the 36% of respondents who considered costs to be greater than benefits did not take all these indirect values into account. On the other hand, if the company perceives costs as greater than benefits, they are more likely to act on that perception.

5.3 WHAT ARE THE PROBLEMS OF ISO 14001 IMPLEMENTATION IN AUSTRALIA?

Survey respondents cited many problems met by early adopters for ISO 14001 implementation in Australia. The commonly cited problems are discussed below.

5.3.1 Interpretation of the requirements by the auditor is a major problem

Seven companies identified the interpretation by certification auditors to be a major problem for ISO 14001 implementation in Australia. They reported that not enough well qualified/experienced auditors were available for the industry. Also, the ISO 14001 system had to be rewritten for each auditor in each state. Documentation demands by some auditors are extreme and render the system useless. As some respondents pointed out:

> *"Adherence to the strict implementation of ISO 14001 is highly reliant on the individual auditor's interpretation of the standards. Therefore, guidelines are just plain guidelines and may differ depending on the auditor". "Auditors must have real, line management industrial experience or they will destroy the credibility of the EMS approach and standard".*

5.3.2 Some companies became uncertain about ISO 14001 standard

After several years of practice in Australia, some companies became uncertain about ISO 14001 standards. They are suspicious of the function of ISO 14001 standards. One respondent thought that a committee, "international bureaucrats", designed ISO 14001. They stated that it was full of promises and that the ISO 14001 process was more impressive on paper, but did not generally follow-up with action. They said:

> *"ISO 14001 is just another academic/ government/ environmental imposition on managers, without due*

consideration of the need to train suppliers and subcontractors. How many trade courses require environmental training?" "Organizations and industry try to achieve too much and expect too much from the system, it is meant to be used as a system for slow consistent change." "Very comprehensive management system that I suspect will be more difficult to maintain than achieve." Also, the jargon of ISO 14001 confused some of the organizations: *"Terminology such as aspects and impacts is confusing. Otherwise it is a good environmental management system."*

5.3.3 Too much time consumption and documentation

According to the results presented in Chapter 4, time consumption (64.3%) presented the greatest difficulty for organizations in Australia when implementing ISO 14001. Too much documentation was another problem. They indicated that " *ISO 14001 certification needs very heavy documentation and documented proof*', and they hope that:

> *"with the development of EMS, there will be less emphasis on documentation and more emphasis on process."*

5.3.4 Insufficient support or lack of understanding from government, public and community and top-management

From the survey results and previous discussion, it can be assumed that ISO 14001 implementation in Australia does not appear to be supported enough by government, public and community. Several surveyed organizations suggest that:

> *"Regulators should acknowledge ISO 14001 certification and reduce license fees etc. as encouragement for its implementation. Companies with ISO 14001 should gain some credit/exemptions in licensing and permits. For example,*

> *provide cash back incentives ($5000 to $15000) to certified and experienced companies. Reward good environmental practice. As well as punish poor practice". "Tendering process should be easier for companies with certification. The benefit to users should be visible through a percentage tender cost for environment. Emphasize communication to interested parties". "Organizations with significant impact should be encouraged to adopt ISO 14001. Make it easy for those who truly want to do the right thing". "Encourage further self-assessment processes rather than regulation. Encourage advice and assist when dealing with cooperative companies - apply regulation as last resort."*

Successful ISO 14001 implementation also requires commitment from top-management. Without top-management commitment, the resources and support necessary for EMS implementation is much more difficult to obtain. One respondent said: *"Require senior management commitment".*

5.3.5 Problems with integrating an ISO 14001 EMS and other existing management system

One respondent said:

> *"ISO 14001 is a very important certification; Integrated ISO 14001 and ISO 9000 surveillance audits are starting to occur. In interests of cost effectiveness, this process needs speeding up."*

Most companies implementing an EMS already have some type of management system in place. Ignoring those existing systems would result in parallel or duplicate systems that would create inefficiencies and place an excessive burden on organizations. Employees will have to deal with multiple or even contradictory systems. There would

be an enormous amount of excess paperwork that adds little value to the overall success of the implementation of ISO 14001.

The above problems have been already experienced by early adopters of ISO 14001 in Australia. These past experiences might be used by later adopters and regulators to find a better way to deal with these problems and avoid some of the pitfalls.

"*If we could start over.*" Mickim (1998, p. 14) mentioned in his article:

> *"It would be useful to first prepare a detailed brief to senior management detailing the benefits, costs and implications of developing and implementing an Environmental Management System, highlighting the need for senior management to champion the system. Next, see if the program managers were willing to personally explain the benefits to staff and what would be involved to ensure successful implementation. Then, conduct some very basic, but site-specific environmental awareness training. Next establish a multidiscipline steering group and employ experts to conduct an initial environmental review/audit with the purpose of identifying and gap analysis to determine where we are now and what needs to be achieved to get to where we want to be (compliance or beyond). From this review/audit an action plan would be developed. The action plan would assign personnel and resources to each objective. We would then conduct monthly meetings with all the relevant staff to review progress and discuss issues, which inevitably arise".*

Chapter 6 Conclusion

6.1 SUMMARY

This research has reviewed the background of the ISO 14000 series and general application of the ISO 14001 standard in Australia. From the review, it is apparent that:

1. ISO 14000 standards are designed to provide an internationally recognized framework for environmental management, evaluation and auditing. They do not prescribe environmental performance targets, but instead provide organizations with the tools to assess and control the environmental impact of their activities, products and/or services. The standards are designed to be flexible enough to be used by any organization of any size and in any field.

2. ISO 14001 is the centrepiece of the ISO 14000 series. To become certified under ISO 14000, organizations must meet the requirements laid out in ISO 14001. Although many drivers and benefits of ISO 14001 implementation are mentioned by different authors, there have also been criticisms against the standard. Costs of implementation of ISO 14001 include internal and external costs. Costs will depend on the scope of the EMS. Companies are finding that the major cost is employee time.

3. Australia adopted the ISO 14001 standard in 1996. By March 2000, 587 sites/organizations across 199 companies have attained ISO 14001 certification, most of them manufacturing companies. The number of ISO 14001 certified organizations has increased annually from 1996 to 1999. The highest number of

certified organizations are concentrated in New South Wales. NCS International Pty Ltd, a company providing certification and auditing services, occupies more than half of the certification market in Australia.

This research also conducted a mail survey to provide a more current understanding of ISO 14001 implementation in Australia. Seventy-three companies, of 190 responded to the mail survey. The response rate was 39.9%. However, these respondents covered 50.9% certified sites in Australia. Most of them were manufacturing companies, which held certification based on particular sites. Their main pollutants include wastewater emission, waste air emission, noise, solid waste residue, chemicals and so on. From the results of the mail survey, three questions were used to explore "what are the most important reasons for organizations in Australia to adopt ISO 14001?"; "what are the benefits and costs of implementation in Australia?"; and "what are the problems of ISO 14001 implementation in Australia?".

From the results and discussion of the mail survey, it can be concluded that:

1. The most important reasons for organizations in Australia to pursue ISO 14001 are "improving environmental performance"; "enhancing due diligence"; and "improving regulation compliance". Environmental reasons are more important than other reasons such as competitive reasons outlined in the earlier literature;

2. The costs of implementing ISO 14001 in Australia are very different from one company to another. It depends on many factors such as the number of sites and programs. Most respondents reported benefits from ISO 14001 implementation that were not market or trade-related, including "changing management's environmental awareness"; "improving the organization's environmental performance"; "improving the management system for environmental accidents and risks"; "promoting compliance with existing national and state laws"; and "improving the internal environmental management methods". This suggests that there are more internal reasons than market benefits for organizations in Australia. More than half

of the people indicated that costs were less than benefits, although 36% believed costs to be greater than benefits. Costs and benefits are very difficult to measure;

3. There are several problems arising when implementing ISO 14001 in Australia. These relate to: (i) the interpretation of ISO 14001 requirements by auditors is a major problem; (ii) organizations become uncertain about the purpose of the ISO 14001 standards; (iii) too much time consumption and documentation; (iv) insufficient support or lack of understanding from government, public and community and top-management; and (v) problems with integrating EMS and other existing management systems.

These conclusions lead to certain recommendations for ISO 14001 implementation in Australia:

1. Environmental management auditors should be trained to satisfy requirements defined in ISO 14012.

2. Organizations in Australia need to take time to gain a thorough understanding of ISO 14001 standards. The systems need to be written from the point of view of the workers who have to implement them.

3. Although proper documentation will enable the system to be evaluated and assists an organization to control plans and operate criteria (Wilson, 1999), the management system should not be measured by the size of the documentation.

4. Government and community should support the dissemination of ISO 14001. Without the resources and support, ISO 14001 implementation is much more difficult to obtain. The reporting and inspection of regulators may be streamlined. Preference in contracts and tenders should be considered for organizations with ISO 14001 certification.

5. Secure top-management commitment early in the process.

6. Environmental Management Systems and other existing management systems in organizations need to be re-designed to encourage better integration.

7. Involving representatives from different parts of organizations was one of the key elements in successful EMS implementation.

6.2 FURTHER STUDIES

As mentioned in Chapter 3, one of the limitations of this research was that the research sample represented the point of view of only one person within each company who was generally the nominated public contact point on the official JAS-ANZ registers. For example, in the majority of instances, the decision was made by the Board of Management or overseas parent company, not the respondent. This research could be undertaken with a more senior management group and Board to further understand why Australian organizations pursued ISO 14001.

This research studied the status of ISO 14001 in various sized companies, but did not further study the difference of large companies and small-medium size companies. Future research could assess the possible differences between large and small-medium companies in terms of their implementation of ISO 14001.

ISO 14001 can provide flexibility to command and control regulations. This could be another future topic: "What are the implication of ISO 14001 implementation to regulators in Australia?"

Another interesting topic for further study would be the influence of ISO 14001 implementation on trade for Australia. This research has indicated that most of the responding companies believed that environmental reasons are more important than competitive reasons, suggesting that trade opportunities are not yet realized.

6.3 CONCLUDING STATEMENT

In conclusion, businesses certified ISO 14001 in Australia, no longer see "the environment" as just a "problem". They are adopting the concept of "environmental management", a concept that will increasingly influence business thinking in Australia, as it is doing internationally. According to the newest information from ISO World (2000), there are 1,053 organizations certified to ISO 14001 up to December 30, 2000 in Australia. Although it is difficult to identify the reliability of this information*, it suggests a strong increase in the number of businesses in Australia pursuing ISO 14001 implementation. The future therefore remains optimistic for ISO 14001 implementation in Australia, but some action is needed to overcome the problems experienced by early adopters.

* It has not been possible to get details of exactly what the 1,053 organizations are. It appears that this is the number of sites, in which case the number has almost doubled from the 586 sites in March 2000. This increase seems very large, which throws some doubt on the accuracy of recent figures.

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Appendix

APPENDIX 1: INFORMATION SHEET FOR QUESTIONNAIRE

APPENDIX 2: QUESTIONNAIRE

APPENDIX 1: THE INFORMATION SHEET FOR QUESTIONNAIRE

University of Tasmania
School of Geography & Environmental studies

Information Sheet:

A Study of ISO 14001 Implementation in Australia

This research is being carried out by Ning Huang. The supervisor of the project is Assoc. Prof. John Todd.

You have been asked to complete a questionnaire as part of a student research project in the School of Geography and Environmental Studies at the University of Tasmania. The project is part of the requirements of the Master of Environment Management Degree. This questionnaire should take 15 to 30 minutes to complete.

The project is aimed at surveying the current status of ISO 14001 implementation in Australia. The information gathered would be analysed in order to determine why organizations pursue ISO 14001 in Australia and the benefits and costs of ISO 14001 implementation in Australia.

The data from individual organizations for this survey will remain confidential, and anonymity will be protected at all times. The questionnaires will be stored securely, and the only people who have access to them will be the researchers listed above. Only aggregated data will be presented in the thesis and any reports/papers prepared.

Participation is entirely voluntary and participants can withdraw from the study at any time, without explanation.

This project has received ethical approval from the University Ethics Committee. If you have any concerns of an ethical nature or complaints about the manner in which the project is conducted you may contact the Chair of the University Ethics Committee, Dr Margaret Otlowski on (03) 62 267569, or the Executive officer, Ms Chris Hooper, on (03) 62 262763.

We are aware that other surveys of ISO 14001 certified businesses are underway in Australia. We believe this reflects the importance of ISO 14000 to business and academic institutions involved in training professionals in this field, and hope you will find time to complete this survey.

Your cooperation is much appreciated. **All businesses returning a completed questionnaire will be sent a short summary of the results towards the end of 2000.**

The contact for this project is Assoc. Prof. John Todd, University of Tasmania. GPO Box 252-78, Hobart Tas 7001. (03) 62 262390. E-mail John.Todd@utas.edu.au.

GPO Box 252-78 Hobart
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E-mail Admin.Officer@geog.utas.edu.au

APPENDIX 2: QUESTIONNAIRE

Your assistance in completing this questionnaire is much appreciated, Please return the completed questionnaire to: Ning Huang, School of Geography and Environmental Studies, University of Tasmania, GPO Box 252-78, Hobart, Tas 7001, Australia.

QUESTIONNAIRE

If precise answers are not possible- please write comments in any blank space on this questionnaire.

1. **How do you describe the core business activity of your company?**

_____

2. **Your ISO 14001 certification is on the basis of:**

☐The whole company

☐A subsidiary company

☐The particular site/s

3. **When did you first attain your ISO 14001 certification?**

☐1996

☐1997

☐1998

☐1999

☐2000

4. **Where is the source of information for ISO 14000 series among your company?**

☐ Local media, TV

☐ NGOs

☐Government organization

☐ISO 14000 groups

☐Industry Association

☐Others_____

5. **Is your company also ISO 9000 certified?**

   ☐Yes-whole company

   ☐Yes-part of company

   ☐No

6. **How many employees do you have at your company?**

   Total: _____ (approximate)

   How many employees does the company have in Australia?
   Total: _____ (approximate)

   How many internationally?
   Total: _____ (approximate)

7. **Did you have an Environmental Management System (EMS) in place prior to deciding to seek ISO14001 certification?**

   ☐Yes

   ☐No

8. **Has your company paid any environmental fines over the last 15 years?**

   ☐Yes

   ☐No

   ☐Don't know

   If Yes, how much did this cost your company?
   Amount: $_____

9. **Has your company received complaints in the past from local residents, nature protection groups or other interest groups in relation to its environmental performance, e.g. complaints from local residents regarding air pollution?**

   ☐Yes

   ☐No

   ☐Don't know

10. Does your company publish an annual environmental report/statement?

☐Yes

☐No

If Yes, it would help my studies if a copy could be included with this completed questionnaire.

11. Following are some reasons, based on published literature, that explain why companies might develop EMS and pursue ISO 14001 certification. Would you please rate each statement on a scale of 1 to 4, where 4 is not important, 3 is neither important or unimportant, 2 is important and 1 is very important.

Organizational

___To formalise support for environmental programs within the organisation

___To standardize environmental activities within the organization

___To enhance due diligence

___Others_____

Financial

___To control costs

___To reduce insurance premiums

___To get better access to finance

Environmental

___To improve environmental performance

___To conserve materials and energy

___Others_____

Regulatory

___To influence government regulatory change

___To improve knowledge of regulations

___To improve regulatory compliance

___Others_____

Competitive Advantage

___To improve access to Australian markets

___To improve access to international markets

___To improve marketing opportunities

___Others_____

Public Relation

___To meet customers expectations

___To improve public relations

___To meet community expectations

___Others_____

12. Which of the following potential benefits have resulted from implementation of ISO 14001?

- ☐ It has improved organization's environment aspect and performances.
- ☐ It has changed management's environmental awareness in organization
- ☐ It has enhanced employee's environmental capacity building.
- ☐ It has improved the internal environmental management methods.
- ☐ It has improved the management system for environmental accidents and risks.
- ☐ Its adoption is cost-effective and productivity improvement.
- ☐ It has promoted compliance with existing national and state laws.
- ☐ It has improved public relations, work relations within your organization, and relations with government bodies responsible for environmental matters.
- ☐ It has attracted "Green"consumers and gained competitive advantage in market.

☐ It has encouraged other environmental initiatives, such as environmental labelling of products or community environmental projects.

13. What are the difficulties with the ISO 14001 adoption process?

Documentation	☐No ☐Low ☐High
Staff training	☐No ☐Low ☐High
System review	☐No ☐Low ☐High
Cost for ISO implementation	☐No ☐Low ☐High
Consultant cost	☐No ☐Low ☐High
Time consumption	☐No ☐Low ☐High
Monitoring measurement	☐No ☐Low ☐High
Structure and responsibility	☐No ☐Low ☐High
Define the priorities process of services impact	☐No ☐Low ☐High
Objective and targets	☐No ☐Low ☐High
Auditing	☐No ☐Low ☐High
Define the environmental policy	☐No ☐Low ☐High
Communication internal/external	☐No ☐Low ☐High

14. This question seeks information on the cost and time associated with ISO 14001 implementation in your company. If you prefer to not supply this information, please move to the next question. In the past 12 months:

- Approximate hours of work attributed to ISO 14001 by all staff
  _____ Hours
- Costs, if any, of staff training programs linked to ISO 14001
  $_____
- Cost of publication of environmental statement
  $_____
- Fee for external validation
  $_____
- Certification fee
  $_____
- Compare the estimated costs of ISO 14001 certification with the potential benefits

  ☐Costs greater than benefits

  ☐Costs equal to benefits

  ☐Costs less than benefits

15. What other ISO 14000 standards do you see as providing the most useful support to your ISO 14000 registered EMS?

☐Environmental Auditing (ISO 14010, 14011, 14012)

☐Environmental Labeling (ISO 14020, 14021, 14024)

☐Life Cycle Assessment (ISO 14040, 14041)

☐Terms and Definition (ISO 14050)

16. How often does senior management review your Environmental Management System?

☐Every _____Months
or

☐Every _____ Years

17. Do you think that further environmental improvement is possible in your company?

☐Yes

☐No

☐Don't know

18. Your position and responsibility in company is:

_____

_____

_____

19. What are the main pollutants/wastes or other environmental impacts or other potential environmental impacts that you must control in your company?

20. Do you have any critical opinions about ISO 14001 implementation and any other comments about ISO 14001 certification in Australia?

21. What advice would you offer to regulators (federal, state, council) as they look for ways to use the EMS approach and ISO 14001 in their interactions with the regulated community?

Thank you for taking time to complete this questionnaire. Would you please now mail the questionnaire to the address for return at the top of the first page.